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# HARD RED SPRING WHEAT



## QUALITY REPORT

Physical, Chemical, Milling, and Baking Characteristics

1973 C R O P

UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
NORTH CENTRAL REGION



UNITED STATES DEPARTMENT OF AGRICULTURE  
AGRICULTURAL RESEARCH SERVICE  
in cooperation with  
STATE AGRICULTURAL EXPERIMENT STATIONS

REPORT OF PHYSICAL, CHEMICAL, MILLING, AND BAKING EXPERIMENTS

WITH HARD RED SPRING WHEAT

1973 CROP<sup>1/</sup>

by

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1/ This is a progress report of cooperative investigations containing some results that have not been sufficiently confirmed to justify general release; interpretations may be modified with additional experimentation. Confirmed results will be published through established channels. The report is primarily a tool for use of cooperators and their official staffs and to those persons having direct and special interest in the development of agricultural research programs.

This report is compiled by the Agricultural Research Service, U.S. Department of Agriculture. Special acknowledgment is made to the North Dakota State University for their facilities and services provided in support of these studies. The report is not intended for publication and should not be referred to in literature citations nor quoted in publicity or advertising. Use of the data may be granted for certain purposes upon written request to the agency or agencies involved.

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Hard Red Spring and Durum Wheat Quality Laboratory  
Fargo, North Dakota



## COOPERATING AGENCIES, STATIONS, AND PERSONNEL

The cooperating agencies and stations conducting the varietal plot and nursery experiments from which the 1973 spring wheat samples were received are listed below:

### California Agricultural Experiment Station:

El Centro

### Idaho Agricultural Experiment Station:

Aberdeen

### Minnesota Agricultural Experiment Station:

Crookston, Morris, and St. Paul

### Montana Agricultural Experiment Station:

Bozeman, Havre, and Sidney

### North Dakota Agricultural Experiment Station:

Carrington, Dickinson, Fargo, Minot,  
and Williston

### South Dakota Agricultural Experiment Station:

Brookings and Watertown

### Wisconsin Agricultural Experiment Station:

Madison

### Wyoming Agricultural Experiment Station:

Sheridan and Torrington

A complete list of all cooperating agencies, stations, and personnel for the year will be found in the report by R. E. Heiner, et al., Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1973.



## INTRODUCTION

Samples of standard varieties and many of the new strains of hard red spring wheat grown in cooperative experiments in the spring wheat region of the United States<sup>2/</sup> have been milled each year by the USDA. The flours were assayed chemically and physically and baked into bread to determine the quality characteristics. The purpose of this report is to make available to the cooperators, quality data on the standard varieties and new strains of hard red spring wheat from the 1973 crop.

The same general format and techniques were used in evaluating the wheats as outlined in quality reports for previous years. The data contained in this report are comparable to data in past reports and, where applicable, average results and also the average results of the 1972 crop are compared.

The format adopted in 1962 for the evaluation of a sample utilized three categories: kernel characteristics, milling performance, and baking evaluation. The basic difference between this report and previous reports is the manner in which the ratings were obtained. Previous to the 1970 crop report, an individual judgment was used to ascertain the rating for each sample. A brief description of the new technique is given on pages 9 and 10 of this report. It is hoped that with this technique, a more objective evaluation has been obtained. Also, it is now possible to quickly deduce the various characteristics of the selection and any outstanding features or deficiencies which are apparent. No specific comments are made regarding the mixogram patterns, since reference mixograms for each of the general types are presented at the end of the report.

The 1973 crop was grown under less than favorable conditions with a lack of rainfall during most of the growing season even though an early spring thaw allowed for an unusually early seeding. The average extraction was lower than the 1972 crop, and the flour mineral content at 65% extraction was higher even though the wheat mineral content was the same. The protein content was approximately 1% higher than last year.

The baking performance was somewhat better than last year. The absorption was higher and averaged 2.0% more. The protein content of the wheat was higher, and the loaf volume was greater. The doughs were slightly stronger than last year, which might be expected because of the higher protein content.

The oxidation requirements for the 1973 crop were somewhat erratic but on the average required about the same amount of bromate as last year.

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<sup>2/</sup> Heiner, R. E., Elsayed, F. A., and Quick, J. S. Wheat Varieties Grown in Cooperative Plot and Nursery Experiments in the Spring Wheat Region in 1973. Agricultural Research Service, U.S. Department of Agriculture and State Agricultural Experiment Stations, St. Paul, Minn.



## SOURCE OF THE SAMPLES

Tests were performed on 579 samples received from field plots, uniform regional nurseries, and sawfly yield nurseries of the 1973 crop. These samples originated in eight states: California, Idaho, Minnesota, Montana, North Dakota, South Dakota, Wisconsin, and Wyoming. Eighteen stations from these states were represented, namely, El Centro in California; Aberdeen in Idaho; Crookston, Morris, and St. Paul in Minnesota; Bozeman, Havre, and Sidney in Montana; Carrington, Dickinson, Fargo, Minot, and Williston in North Dakota; Brookings and Watertown in South Dakota; Madison in Wisconsin; and Sheridan and Torrington in Wyoming.

Due to apparent differences in the characteristics of the wheats and protein contents, no samples were blended this year.

On page 5 are listed the spring wheats that were included in the 1973 Uniform Regional Nursery trials. The variety or cross, the station that developed the variety, the state selection number, and the C.I. number are given.

In Table 16 are given the average data for the Uniform Regional Nursery samples. The data for kernel characteristics and milling performance are arithmetical averages of the individual samples. However, the mixograms and baking data were obtained from blends of equal proportions of the individual flours for each sample from the 17 stations.

In Table 21 are given the average data for the Sawfly Yield Nursery samples obtained from the arithmetical averages of the individual samples.



ENTRIES FOR THE 1973 UNIFORM REGIONAL HARD RED SPRING WHEAT NURSERY

Entry No.	Cross or Variety	C.I. or Sel. No.	Year Entered	Source
1	MARQUIS	3641	1929	Canada
2	JUSTIN	13462	1959	ND
3	SELKIRK	13100	1953	Canada
4	CHRIS	13751	1960	USDA-MN
5	WALDRON	13958	1964	ND
6	ELLAR	ND491 <sup>a/</sup>	1970	ND
7	WALDRON/RL4205	ND507	1972	ND
8	ND455*2/AGATHA/3/3*ND455//T1673/3*KT48	ND510	1972	ND
9	ND487/WALDRON	ND518	1973	ND
10	ND480//POLK/WISC261	ND519	1973	ND
11	JT/ND142//WISC261	ND520	1973	ND
12	HRY*5/P54//4*LT/3/RMR	H681-4-5	1973	WI
13	ERA	13986**	1968	USDA-MN
14	II-55-14/II-60-105	II-64-27**	1972	USDA-MN
15	do	II-64-33**	1972	USDA-MN
16	ND476//CLY/ND122	ND508**	1972	ND
17	ND441sib*2/AGENT//3*ND441sib/T.der./ 3/2*ND441/SUWON92	ND521**	1973	ND
18	ND491/FLETCHER	ND522**	1973	ND
19	ND487/4/WALDRON/3/AGENT/T1673-KT48// SUWON92	ND525**	1973	ND
20	PJ60/3/HRY*7/P54//K184/7*WIS250/4/ K184/4*WIS250	H678-1-6-9**	1969	WI
21	JT/3/NRN10/BVR14//4*CNT	MT7150**	1973	USDA-MT
22	SK/3/NRN10/BVR14//CNT	MT7028**	1973	USDA-MT

<sup>a/</sup> Named and released by the North Dakota Agricultural Experiment Station on January 24, 1974.

\*\* Semidwarf



## METHODS

The terminology and methods used are briefly described below:

Test Weight Per Bushel - The weight per Winchester bushel of cleaned, dry, scoured wheat. To determine the dockage-free test weight on a comparable sample, approximately one pound per bushel should be subtracted from the value given.

1000 Kernel Weight - The 1000 kernel weight was determined by counting the number of kernels in a 10 gram sample of cleaned, picked wheat with an ASCO Seed Counter<sup>4/</sup>.

Kernel Size - The percentages of the size of the kernels (large, medium, and small) were determined on a wheat sizer as described by Shuey<sup>5/</sup>.

The sieves of the sizer were clothed as follows:

Top Sieve	- Tyler # 7 with 2.92 mm. opening
Middle Sieve	- Tyler # 9 with 2.24 mm. opening
Bottom Sieve	- Tyler #12 with 1.65 mm. opening

Potential Yield - The potential yield is not shown on the computer tables but it can be determined by multiplying the percentages of the overs of each sieve #7, #9, and #12, by the value of 78%, 73%, and 68%, respectively. The accumulation percentage would be the potential yield.

Milling - The samples were cleaned by passing the wheat over an Emerson Kicker and Dockage Tester and through a modified Forster Scourer Model 6. The clean dry samples were pre-tempered to 12% moisture for at least 72 hours; then tempered to 16% moisture and allowed to stand overnight prior to milling.

All samples except the field plot samples were milled on a Brabender Quadrumat Junior Mill. The mill was equipped with a #18 wire on the drum sieve. The throughs of the #18 wire were rebolted on a Strand Sifter equipped with a #60 Tyler sieve. The sample was sifted for 1 minute. The throughs of the #60 wire were classified as flour and this was the material tested. The overs of the #18 wire were classified as bran and the throughs of the #18 wire and overs of the #60 Tyler sieve as crude shorts.

The field plot nursery samples were milled on a Buhler Continuous Experimental Mill. This mill has been slightly modified to give results

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<sup>4/</sup> Mention of a trademark name or a proprietary product does not constitute a guarantee or warranty of the product by the U.S. Department of Agriculture, and does not imply its approval to the exclusion of other products that may also be suitable.

<sup>5/</sup> Shuey, William C. A Wheat Sizing Technique for Predicting Flour Milling Yield. Cereal Science Today 5: 71-72,75 (1960).



more comparable to commercial milling. The break scalping sieves were clothed with #54 stainless steel wire, the reduction scalping sieves with #58, #66, and #105 stainless steel wire for the first, second, and third reduction, respectively. All of the flour sieves were clothed with #135 stainless steel wire.

All six flour streams were combined to give the patent flour. The extraction of a good milling wheat using this flow is approximately 68%. This is comparable to a commercial "long patent" extraction flour. At this flour extraction of the wheat, the changes in flour ash are most sensitive to changes in percent extraction.

Protein Content - The protein was calculated by multiplying the factor of 5.7 times the percent nitrogen as determined by the standard Kjeldahl procedure.

Mineral Content or Ash Content - This was determined by measuring the residue of the minerals left after incinerating the sample for approximately 16 hours at 565° C. The results were reported as percentage of the sample that was incinerated.

Mixogram - The mixogram was determined by using 30 g. of flour and adding 20 cc. of water. The sensitivity spring setting was set at 10. All mixograms were run with constant weight of flour and volume of water. Absorptions reported were adjusted according to the height of the mixogram. The correction factor was determined from a series of flours by varying the amount of absorption.

Mixogram Pattern - The reference mixogram patterns given at the end of the report demonstrate the different types of mixograms that were obtained. A single number is assigned each pattern to characterize and simplify the classification of the curves--the larger number indicating stronger curve characteristics.

Baking Procedure or Formula - The baking formula used was as follows:

100% flour	3% milk D.S.M.
2% salt	3% yeast
5% sugar	2% shortening (Crisco, melted)

The sample was mixed to development in a National Manufacturing mixer--for the 25 g. sample the Micro mixer, and for the 100 g. sample the 100 g. Special mixer size. Also, for the 25 g. samples 10 p.p.m. of bromate was used for oxidation, and for the 100 g. samples 5 p.p.m. of bromate was used, and 0.1% Barley Malt Flour for enzymatic supplement for both size samples. The dough samples were moulded in a Roll-Er-Up moulder.

Absorption - This was the water, expressed as percent of the flour, required to bring the dough to proper consistency.



Crumb Color - This value was determined by comparing the loaf of the tested sample against a baking standard. This standard was selected as an average for the crop year for the spring wheat area.

Loaf Volume - This was volume of the baked loaf as determined by seed displacement.

All values (Protein, Ash, and Absorption) were reported on a 14% moisture basis.



## DISCUSSION

The following discussion presents some of the basic techniques and criteria used in the milling and baking quality evaluation of the samples. There are four major evaluation categories used: kernel characteristics, to characterize the kernel; milling performance, to evaluate the general milling characteristics; mixogram patterns, to classify the flour as to type; and baking evaluation, to rate the flour as to overall baking.

Each evaluation category can be important. A sample could be of a sufficiently poor quality for a given category to eliminate it from possible future testing. However, a sample submitted for the first time and found to be questionable should be tested again to establish if it has a satisfactory or unsatisfactory classification. A sample which is consistently rated as questionable should be discarded.

A computer program for evaluating milling and baking quality was developed from 749 previously evaluated uniform regional nursery samples. The samples represented 5 crop years, 7 states, 21 stations, and 33 series. Chris, Justin, and Selkirk were selected as the standard varieties for each series. The percent deviation of each independent variable varied from the mean of the standard varieties was determined. Limits consistent with previous data obtained on the 749 samples were established for each independent variable. Nebraska regressions were run to establish the regression coefficients of each variable.

Six characteristics (test weight, 1000 kernel weight, percent large kernels, percent small kernels, wheat mineral, and wheat protein) were independent variables used to calculate the dependent variable - Kernel Characteristics. Four characteristics (percent extraction, mineral @65% extraction, milling characteristic, and protein difference between flour and wheat protein) were used to calculate the dependent variable - Milling Performance. Bake absorption, mixing time, dough characteristics, crumb color, crumb grain, and loaf volume were the six independent variables used to determine the dependent variable - Baking Evaluation. These three dependent variables after calculation become independent variables used to calculate the dependent variable - General Evaluation.

The three dependent variables, Kernel Characteristics, Milling Performance, and Baking Evaluation are rated on a scale of 1 to 8, with 1 being Very Satisfactory and 8 being Unsatisfactory. The General Evaluation is rated on a scale of 1 to 4, with 1 being no promise; 2, little promise; 3, some promise; and 4, good promise. If one of the independent variables conver value is 8 (with the exception of crumb color), this automatically will rate the General Evaluation as 1, or no promise. If there are no 8's, the three values are employed in a regression equation to derive the General Evaluation. The weighted value for each of these variables on the General Evaluation are approximately 6% for Kernel



Characteristics, 47% for Milling Performance, and 47% for Baking Evaluation.

To quickly point out problem areas for a selection, two additional columns have been added to the printout. One column is minor deficiencies in which the independent variables converted to a 5 or 6, that is Questionable or Questionable to Unsatisfactory, will appear. The second column is major deficiencies in which the independent variables were converted either to a 7 or 8, that is Unsatisfactory to Questionable and Unsatisfactory. Deficiencies of the various selections may be readily determined by scanning these columns. It is also possible to have one or two independent variables that would appear in the major deficiency column, rating 7. These characteristics should be given serious consideration even though they do not influence the general rating sufficiently to rank the selection as having no promise.

All samples, as in previous years, are compared to a milling and baking standard that represents a blend of the crop year blended to a known quality. However, the samples for the individual stations are evaluated against the average results of the check varieties from the respective stations. The agronomic and climatic conditions of the individual locations can effect the quality of the wheat sample, such that the evaluation at certain locations could have all samples--even the named varieties--classified as Questionable to Unsatisfactory. Therefore, the evaluation ratings of one station are not directly comparable to those of another station. For example, an area may produce low protein wheats which give large and plump kernels, good milling and kernel characteristics, but low protein and unsatisfactory baking properties such as short mixing time, low loaf volume, and weak dough characteristics. The wheat from this area could not be considered as a strong spring wheat and would not maintain the quality expected from the spring wheat producing area. A good variety should have tolerance to a wide range of environmental conditions and the overall picture should be taken into consideration for establishing these varieties.

Kernel Characteristics are important in determining the initial value of the wheat and, if extremely poor, could disqualify a new variety from further consideration. Because of the present grading system, it is desirable to have a good test weight. If a sample has a low 1,000 kernel weight and small kernel size distribution, it would be considered a poor sample for milling because of the high ratio of bran to endosperm. Therefore, it is desirable to have plump kernels. Wheat ash is an important factor when comparing a variety against other standard varieties. If a sample consistently has higher wheat mineral content, it increases the probability of having high flour ash. Lower protein than the standard varieties is not desirable because in a low protein crop year the probability of it having such a low protein as to be undesirable is much greater. Therefore, the protein must also be considered as a characteristic when comparing varieties grown in the same locality.



Milling Performance is very important, especially the sub-category of milling characteristics. If low extraction or high flour ash is obtained, these become major factors which are quite unacceptable from a commercial milling standpoint. All flour mineral contents are reported at a constant extraction of 65% so that the figures are directly comparable. As a rule of thumb, one can approximate that each point of ash (0.01%) is equivalent to approximately 2% in extraction.

Milling characteristics are important. A sample which tends to be soft in character requires a different milling technique to be milled properly. On commercial mills flowed for hard vitreous spring wheats, soft milling characteristics cause great difficulty. Therefore, if a sample shows softness in character, it is considered to be unsatisfactory. Likewise, a sample which is extremely hard and vitreous will cause difficulty. Both types of wheat (soft and vitreous) require different roll pressures, clothing, sifter surface, and temper to be milled properly. If these wheats are blended with normal milling wheats, improper results are obtained since these characteristics are not necessarily compatible or additive. Normal to soft score indicates that the sample shows a tendency toward softness of character on the flour mill stocks and extraction. This would indicate that the sample may give some difficulty for certain mill streams, and an adjustment would either have to be made in the milling flow or in tempering procedures to compensate for these differences. The properties of this wheat may or may not be compatible with other wheats with which it may be blended, therefore, it is important to maintain varieties with milling characteristics as uniform as possible.

The amount of protein recovered in the flour for a sample is of importance. The high protein wheats yielding low protein flours are not desirable. Such a wheat would have much of the protein distributed in the outer portion of the kernel which would result in excessive protein in the feed. Therefore, higher wheat protein would be necessary to yield a flour with protein content comparable to that of a wheat that gives good flour protein recovery.

Mixogram Patterns and Farinogram Patterns are important in estimating the strength and mixing tolerance or potential mixing tolerance of a flour. A long, flat curve is more desirable than a short, peaked curve; however, an extremely long curve may be undesirable if the flour would require excessive mixing for proper development. The pattern of the curve is of importance as well as the length, and both must be considered. Abnormal curves, such as sway-back or long initial time to incorporate the water, indicate undesirable characteristics.

Baking Evaluation takes into account the flour absorption, mixing time, dough characteristics, loaf volume, and machinability. A sample which has low absorption would be unsatisfactory compared to other spring wheats with normal absorption. A sample with extremely short mixing time would also be considered undesirable as a good strong spring wheat. When a sample is in the minimal range for these values, it is considered as questionable until further testing demonstrates whether a definite deficiency exists.



Doughs having mellow to weak dough properties show a tendency towards weakness. Also, for mellow to strong, the dough is mellow but has a tendency to be strong, and a strong to mellow dough is just the reverse. Since these characteristics are subjective rather than objective, it is necessary at times to estimate the tendency; therefore, the necessity exists for apparent double grades.

The grain or appearance of the interior of the loaf shows how well the sample stood up during baking and may point out or explain some deficiencies which have been observed during the baking test.

Loaf volume indicates potential strength of the flour in a different manner than mixing time or dough characteristics in that it shows the ability or lack thereof for the dough to expand under pressure and to contain the entrapped gases during this expansion. Weak flours act much like rotten balloons, which burst when blown up and collapse and yield low loaf volume or extremely large volume and large holes in the interior of the loaf. Low protein flours and lifeless (dead) doughs exhibit properties similar to putty and do not expand during fermentation or baking and give low loaf volume. Tough and very bucky doughs are bound too tightly and impede expansion of the gases causing low loaf volume.

General Evaluation rating applies only to the data contained in the year of the report. A new category, The Prospect of a selection, will apply to two or more years of data. The Prospect is given for each selection that has been tested for at least two crop years. This evaluation takes into account the various grading factors and the results of the crop years in an effort to determine if the selection should be considered as a prospective new variety. The main defects and outstanding features are discussed. A selection which is promising should be continued. Those which show some promise with outstanding agronomic characteristics should be seriously considered and looked at in large plots (if it has not been done previously), providing sufficient other information has been obtained. A sample which shows little or no promise should be discontinued.



## FIELD PLOT NURSERY SAMPLES - 1973 CROP

Eighty-four samples were received from three states and four stations. The data for the individual samples are given in Tables 1 through 3. In Table 4 are given the averages of the varieties by state for the following varieties: Chris and Justin for North Dakota. The averages for these commercial varieties per location were used as standards for judging the other samples in the field plots. The 1972 and 1973 averages also are given for the check varieties from the state of North Dakota. The averages for California and Wisconsin are not given since samples from only one station were received. The milling and baking standard Chris blend was used for the Wisconsin samples, since a comparably grown check variety was not included.

### CALIFORNIA SAMPLES

Twenty-one samples were received from the El Centro station. All of these samples were the named varieties, semidwarfs or semidwarf selections, with the exception of Chris. The named varieties were: Ahome 71, Anza, Chenab 70, Nayab 70, Tanori 71, and Torim 73. The results for each variety are given in Table 1. The selections were tested against the average results of Ahome 71 and Tanori 71 as a standard, and also against the regular Chris spring wheat milling and baking standard. Only the data using the Ahome 71 and Tanori 71 as the standard are given, since the Chris check being higher in protein caused a majority of the samples to be rated no promise on the basis of protein content.

It should be noted in Table 1 that many of the selections were given General Evaluations of no promise due to high mineral content at 65% flour extraction, because Ahome 71 had low flour ash at 65% extraction compared to its relatively high wheat ash. This explains why many of the selections were heavily faulted for too high a flour ash. This was taken into consideration when the selections were individually evaluated, thus many of the selections are given better potential than was originally indicated in the General Evaluation of Table 1. The varieties grown this year may be classified as follows:

- Anza - No Promise
- Chenab 70 - No Promise
- Nayab 70 - Little Promise
- Torim 73 - Little Promise



D 7021

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency for high ash at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Tends to show long mixing time and tough dough.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety.

The Prospect - This selection would show some promise as a new variety based on three crop years' results, although it has shown somewhat erratic results.

D 7159

Kernel Characteristics - Satisfactory to Questionable. Tendency for small kernel size.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Satisfactory. Tends to show tough dough characteristics and long mixing requirement.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety.

D 7168

Kernel Characteristics - Satisfactory to Questionable. Shows high wheat ash.

Milling Performance - Questionable. High mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety, although the mineral content is high at this station.

D 7174

Kernel Characteristics - Questionable to Satisfactory. Shows poor kernel size distribution.

Milling Performance - Satisfactory.



D 7174 (Cont'd.)

Baking Evaluation - Satisfactory.

General Evaluation - This selection would show good promise as a new variety for this year's crop, despite having poor kernel size distribution.

D 7188

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency for high ash content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency for long mixing time.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

D 7211

Kernel Characteristics - Questionable. Shows poor 1,000 kernel weight and kernel size distribution and has a tendency for low protein.

Milling Performance - Questionable to Satisfactory. Tendency for low extraction and high mineral content at 65% extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety, although the milling performance was somewhat questionable.

D 7252

Kernel Characteristics - Questionable to Satisfactory. Tendency for minimum test weight and low protein.

Milling Performance - Satisfactory to Questionable. Tendency for maximum flour ash.

Baking Evaluation - Satisfactory to Questionable. Tendency for long mixing and minimum loaf volume.

General Evaluation - This selection would show little promise as a new variety, based on this year's crop results.



D 7257

Kernel Characteristics - Satisfactory to Questionable. Tendency for minimum protein.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

63043

Kernel Characteristics - Questionable to Unsatisfactory. Shows poor kernel characteristics, minimum protein, and maximum ash content.

Milling Performance - Questionable to Unsatisfactory. Shows large protein drop from wheat to flour, and has a tendency for minimum flour extraction.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety primarily due to low flour protein.

63044-54

Kernel Characteristics - Unsatisfactory to Questionable. Shows low protein, low test weight, and small kernels.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory. Low bake absorption and poor dough-handling properties.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety primarily due to poor baking performance.

63044-154

Kernel Characteristics - Unsatisfactory. Low protein, very low test weight, and small kernels.

Milling Performance - Satisfactory to Questionable. Tendency for minimum flour extraction.

Baking Evaluation - Unsatisfactory. Low absorption, short mixing time, and weak dough.



63044-154 (Cont'd.)

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety primarily due to poor baking performance.

68007

Kernel Characteristics - Satisfactory.

Milling Performance - Very Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - This selection would show good promise as a new variety based on this year's crop results.

68008

Kernel Characteristics - Questionable to Satisfactory. Shows high wheat mineral content.

Milling Performance - Satisfactory to Questionable. Tendency for high ash at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Shows tough dough characteristics.

General Evaluation - This selection would show some promise as a new variety based on this year's crop results.

69047

Kernel Characteristics - Unsatisfactory. Low protein and 1,000 kernel weight.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show little promise as a new variety due to low protein content.



NORTH DAKOTA SAMPLES

Fifty-nine samples were received from the Dickinson and the Williston, North Dakota stations. Thirty-six samples were the named varieties which have been released-- Bonanza, Bounty 208, Chris, Era, Fortuna, Glenlea, Justin, Lark, Manitou, Napayo, Norana, Nordak, Norwesta, Olaf, Polk, Waldron, Walhalla, and WS 1809. In addition, two samples were the newly released variety Ellar (ND 491). Twenty-one samples were the experimental selections-- Minnesota II-64-33, North Dakota selections ND 507, 510, 518, 519, 520, 521, 522, 523, 524, and Sawfly S 6662 and S 6916. The results for each variety and selection are given in Table 2. The average results of the 1973 data are given in Table 4.

The average general evaluation, the number of total deficiencies, and the number of major deficiencies are given after each variety or selection-- (Average General Evaluation - #Total Deficiencies/#Major Deficiencies). The varieties grown this year may be broadly classified as follows:

<u>Bonanza</u>	(1.5 - 13/4)	- No Promise
<u>Bounty 208</u>	(1.5 - 7/2)	- No Promise
<u>Chris</u>	(2.0 - 8/1)	- Little Promise
<u>Ellar</u>	(2.5 - 5/0)	- Some Promise
<u>Era</u>	(1.0 - 7/6)	- No Promise
<u>Fortuna</u>	(1.5 - 6/3)	- No Promise
<u>Glenlea</u>	(1.0 - 9/6)	- No Promise
<u>Justin</u>	(3.0 - 2/0)	- Some Promise
<u>Lark</u>	(1.0 - 15/4)	- No Promise
<u>Manitou</u>	(1.0 - 9/2)	- No Promise
<u>Napayo</u>	(1.5 - 7/2)	- No Promise
<u>Norana</u>	(1.5 - 8/6)	- No Promise
<u>Nordak</u>	(1.0 - 8/2)	- No Promise
<u>Norwesta</u>	(1.5 - 10/2)	- No Promise
<u>Olaf</u>	(3.0 - 5/1)	- Some Promise
<u>Polk</u>	(2.5 - 3/1)	- Some Promise



Waldron (2.0 - 6/1) - Little Promise

Walhalla (1.0 - 5/3) - No Promise

WS 1809 (2.0 - 4/2) - Little Promise

MN II-64-33 (1.5 - 7/4)

Kernel Characteristics - Questionable to Satisfactory. Tendency for low test weight and 1,000 kernel weight.

Milling Performance - Questionable to Unsatisfactory. Tendency for low flour extraction and shows high mineral content at 65% flour extraction.

Baking Evaluation - Questionable to Unsatisfactory. Shows weak doughs.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety.

ND 507 (1.0 - 9/3)

Kernel Characteristics - Satisfactory to Questionable. Tendency to have minimum wheat protein content.

Milling Performance - Unsatisfactory. Low flour extraction and high flour ash at 65% extraction.

Baking Evaluation - Questionable to Unsatisfactory. Long mixing time and poor dough-handling properties.

General Evaluation - This selection would show no promise as a new variety based on this year's crop results.

The Prospect - Based on two crop years' results, this selection would show no promise primarily due to poor milling and baking characteristics.

ND 510 (1.5 - 7/3)

Kernel Characteristics - Questionable to Satisfactory. Tendency for low wheat protein.

Milling Performance - Questionable. Shows erratic flour extraction and flour ash.

Baking Evaluation - Questionable to Unsatisfactory. Shows erratic bake absorption.

General Evaluation - This selection shows no promise as a new variety based on this year's crop results.



ND 510 (Cont'd.)

The Prospect - Based on two crop years' results, this selection would show no promise as a new variety because of deficiencies in all categories.

ND 518 (2.5 - 4/0)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

ND 519 (2.0 - 6/2)

Kernel Characteristics - Satisfactory to Questionable. Tendency for low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Satisfactory. Shows erratic bake absorption.

General Evaluation - Based on this year's crop, this selection would show some promise as a new variety.

ND 520 (2.0 - 9/3)

Kernel Characteristics - Questionable to Satisfactory. Tendency for low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Shows long mixing time and tendency for erratic dough-handling properties.

General Evaluation - Based on this year's crop results, this selection would show little promise as a new variety.

ND 521 (1.0 - 2/1) (Williston, North Dakota station only)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable to Unsatisfactory. Low bake absorption.



ND 521 (Cont'd.)

General Evaluation - Based on this year's crop results from only one station, this selection would show little promise as a new variety.

ND 522 (1.0 - 6/2) (Williston, North Dakota station only)

Kernel Characteristics - Questionable to Unsatisfactory. Shows low test weight and low protein content.

Milling Performance - Questionable to Unsatisfactory. Low flour extraction and high mineral content at 65% extraction.

Baking Evaluation - Questionable to Unsatisfactory. Low bake absorption.

General Evaluation - This selection would show no promise as a new variety based on this year's crop results from one station only.

ND 523 (3.0 - 2/0) (Dickinson, North Dakota station only)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Low loaf volume.

General Evaluation - Based on this year's crop from one station only, this selection would show good promise as a new variety.

ND 524 (3.0 - 5/0)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Minimum crumb characteristics.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

S 6662 (2.0 - 5/2)

Kernel Characteristics - Satisfactory to Questionable. Tendency for minimum protein content.

Milling Performance - Questionable to Satisfactory. Erratic mineral content at 65% extraction.



S 6662 (Cont'd.)

Baking Evaluation - Satisfactory to Questionable. Variable bake absorption.

General Evaluation - This selection would show little promise as a new variety based on this year's crop results.

The Prospect - Based on three crop years, this selection would show some promise as a new variety.

S 6916 (2.0 - 7/1)

Kernel Characteristics - Questionable to Unsatisfactory. Low protein.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Shows weak doughs and a tendency for low bake absorption.

General Evaluation - Based on this year's results, this selection would show little promise as a new variety.

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety because of low protein and poor baking quality.

WISCONSIN SAMPLES

Four samples were received from the Madison, Wisconsin station. These four samples included the commercially named variety, Era, and the experimental selections, Wisc 255, Wisc 262, and H678-1-6-9.

The milling and baking standard Chris blend was used as a check for these samples since comparably grown check varieties were not included in the series. All of the selections showed no promise as compared to the Chris standard. However, a comparably grown check variety may have resulted in a more favorable evaluation of these experimental selections. Of the series submitted, H678-1-6-9 was the best overall selection. Data for these samples are given in Table 3.



## UNIFORM REGIONAL NURSERY SAMPLES - 1973 CROP

A total of 375 Uniform Regional Nursery samples were received. The samples represented 17 stations from 7 states. No blends were made of the samples for this crop year due to the lack of compatibility and were milled as individual samples to eliminate any possible erroneous results. Thus a total of 375 samples were milled and baked. Twenty-two samples were received from 16 of the stations, and 23 samples were received from the Aberdeen, Idaho station. Fifteen selections were included for quality evaluation in the Uniform Regional Nursery samples. The remainder of the samples were the commercially named varieties of: Chris, Era, Justin, Marquis, Selkirk, Waldron, and the newly released variety Ellar (ND 491).

Twenty-three samples were received from Aberdeen, Idaho. Data for these samples are given in Table 5.

Sixty-six samples were received from three Minnesota stations: Crookston, Morris, and St. Paul. Data for these samples are given in Tables 6 and 7.

Sixty-six samples were received from three stations in Montana: Bozeman, Havre, and Sidney. Data for these samples are given in Tables 8 and 9.

One hundred and ten samples were received from five stations in North Dakota: Carrington, Dickinson, Fargo, Minot, and Williston. The data for these samples are given in Tables 10 through 12. The samples from Carrington were grown on irrigated land.

Forty-four samples were received from two South Dakota stations: Brookings and Watertown. The data for these samples are given in Table 13.

Twenty-two samples were received from Madison, Wisconsin. The data for these samples are given in Table 14.

Forty-four samples were received from two Wyoming stations: Sheridan and Torrington. The data for these samples are given in Table 15.

In Table 16 are given the average results for each of the twenty-two samples submitted from 7 states and 17 stations. The results for kernel characteristics and milling performance were obtained by averaging the results from the 11 tables--5 through 15. The baking results were obtained from a blend of the flours in equal proportions from each of the stations for the respective variety or selection. The regular 100 g. straight dough rich formula baking procedure was used in baking the flour blends. The General Evaluation column includes the general overall performance of the blend of each sample. The General Evaluation given for the sample may not agree with that of the blend since averages do not express the range, and poor characteristics may be masked. In an endeavor to clarify this problem, the average general evaluation, the number of total deficiencies, and the number of major



deficiencies are shown in parentheses after each variety or selection--  
(Average General Evaluation - #Total Deficiencies/#Major Deficiencies).

For simplicity and brevity of the report, as in previous reports, each variety will be discussed from the general overall viewpoint rather than the individual stations. The general evaluation summarizes the results from the individual stations for one crop year. The evaluation is more meaningful for the overall performance of a variety or selection when at least two or more crop years are included. The data discussed under the category, The Prospect, includes two or more years.

In Table 17, the averages are given by states for the three varieties of Chris, Justin, and Selkirk. This table gives a comparison of the varieties by state, as well as state averages of the three varieties for comparative purposes, and the 1973 grand averages for the three varieties for comparison of the two crop years. In general, the 1973 crop had slightly poorer kernel characteristics (test weight, 1,000 kernel weight, kernel size distribution) than last year, although the protein content was 1% higher. The milling was poorer this year showing a 1.6% lower flour extraction and 3 points higher flour mineral content. The absorption was 2.1% more than last year, which one would expect with the 1.1% increase in flour protein. The mixing time was somewhat longer than last year, as were the mixogram patterns. The dough characteristics were stronger. The crumb color and crumb grain were almost equal to last year's results. The loaf volume was somewhat higher than last year.

The average results of the varieties Chris, Justin, and Selkirk for each of the individual stations were used as a standard for the other selections from that station; therefore, a variety or selection may be rated satisfactory at two different stations, but comparison of the data may show much poorer results for one station due to adverse environmental conditions. Thus, in actuality, the sample with poor results could be rated as unsatisfactory quality wise when compared to the overall spring wheat area. The state averages in Table 17 are additional guides for the relative performance for the crop year by states.

By using a new format and employment of the computer, all named varieties receive a general evaluation. Only those varieties in the "Good Promise" category could be consistently considered as acceptable to the trade both in the domestic as well as foreign markets. However, in order to be brief, the varieties may be broadly classified as follows:

<u>Chris</u>	(3.0 - 36/4)	- Some Promise
<u>Ellar</u>	(2.5 - 27/4)	- Some Promise
<u>Era</u>	(1.4 - 84/37)	- No Promise
<u>Justin</u>	(3.4 - 20/1)	- Good Promise
<u>Marquis</u>	(1.9 - 48/17)	- Little Promise
<u>Selkirk</u>	(2.8 - 45/4)	- Some Promise
<u>Waldron</u>	(2.5 - 26/8)	- Some Promise



H678-1-6-9 (2.3 - 53/7)

Kernel Characteristics - Questionable. Low protein content.

Milling Performance - Satisfactory to Questionable. Tendency for minimum flour extraction.

Baking Evaluation - Unsatisfactory to Questionable. Definite tendency toward minimum absorption, long mixing time, and tough doughs.

General Evaluation - This year's crop results indicate no promise for this selection as a new variety.

The Prospect - Based on three crop years' results, this selection would show no promise as a new variety primarily because of poor baking characteristics of long mixing and too strong doughs.

H681-4-5 (1.6 - 60/17)

Kernel Characteristics - Questionable. Low protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory. Low bake absorption, long mixing, and tough doughs.

General Evaluation - Based on this year's crop results, this selection would show no promise as a new variety primarily due to poor baking characteristics.

MN II-64-27 (3.0 - 32/4)

Kernel Characteristics - Questionable. Low protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Tendency for minimum absorption, long mixing time, and variable dough-handling properties.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety because of erratic results.

The Prospect - Based on two crop years, this selection would show little promise as a new variety primarily because of low protein and variable dough-handling properties.

MN II-64-33 (2.4 - 45/11)

Kernel Characteristics - Questionable. Minimum test weight and a tendency for low protein.



MN II-64-33 (Cont'd.)

Milling Performance - Questionable. High mineral content at 65% extraction.

Baking Evaluation - Questionable. Exhibits weak doughs.

General Evaluation - This selection would show little promise as a new variety based on this year's crop results.

The Prospect - Based on two crop years, this selection would show little promise as a new variety because of deficiencies in all categories.

MT 7028 (1.5 - 70/26)

Kernel Characteristics - Unsatisfactory to Questionable. Low protein and poor kernel characteristics.

Milling Performance - Satisfactory to Questionable. Tendency for maximum ash content.

Baking Evaluation - Unsatisfactory to Questionable. Low bake absorption and erratic dough-handling properties.

General Evaluation - Based on this year's crop results, this selection shows no promise as a new variety primarily due to low protein and poor baking performance.

MT 7150 (2.4 - 40/13)

Kernel Characteristics - Satisfactory to Questionable. Tendency for minimum protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Tendency for low absorption and shows erratic dough-handling properties.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety due to erratic baking performance.

ND 507 (1.2 - 59/23)

Kernel Characteristics - Satisfactory. Tendency toward high mineral content.

Milling Performance - Unsatisfactory. Low extraction and extremely high mineral content at 65% extraction.

Baking Evaluation - Questionable. Erratic dough-handling properties.



ND 507 (Cont'd.)

General Evaluation - This selection would show no promise as a new variety based on last year's crop primarily due to poor milling characteristics.

The Prospect - Based on two crop years' results, this selection would show no promise as a new variety primarily because of poor milling performance.

ND 508 (1.8 - 56/12)

Kernel Characteristics - Questionable to Satisfactory. Tendency for low protein content.

Milling Performance - Questionable to Unsatisfactory. Tendency for low extraction and shows high mineral content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency of weak doughs.

General Evaluation - This selection would show little promise as a new variety based on this year's crop results.

The Prospect - Based on two crop years, this selection would show no promise as a new variety due to poor milling performance and erratic baking characteristics.

ND 510 (2.5 - 39/10)

Kernel Characteristics - Satisfactory. Occasional high mineral content.

Milling Performance - Questionable to Unsatisfactory. Tendency for low extraction and shows high mineral content at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Tendency for low bake absorption and maximum mixing time.

General Evaluation - This selection would show little promise as a new variety based on this year's crop results, primarily due to poor milling performance.

The Prospect - Based on two crop years, this selection would show little promise as a new variety primarily due to high mineral content at 65% extraction.

ND 518 (2.2 - 43/10)

Kernel Characteristics - Satisfactory. Occasional high mineral content.

Milling Performance - Questionable. Tendency for high mineral content at 65% extraction.



ND 518 (Cont'd.)

Baking Evaluation - Questionable to Unsatisfactory. Shows long mixing time and tough doughs.

General Evaluation - Based on this year's crop results, this selection would show little promise as a new variety due to poor milling and baking properties.

ND 519 (2.9 - 30/7)

Kernel Characteristics - Satisfactory to Questionable. Tendency for low protein content.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Occasional low bake absorption and loaf volume, and shows erratic dough-handling properties.

General Evaluation - This selection would show some promise as a new variety based on this year's crop results.

ND 520 (2.2 - 33/8)

Kernel Characteristics - Satisfactory. Occasional high mineral content.

Milling Performance - Satisfactory.

Baking Evaluation - Unsatisfactory to Questionable. Long mixing time and erratic dough-handling properties.

General Evaluation - Based on this year's crop, this selection would show little promise as a new variety because of poor baking performance.

ND 521 (2.8 - 23/5)

Kernel Characteristics - Satisfactory. Occasional high mineral content.

Milling Performance - Questionable to Satisfactory. Tendency for low flour extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency for having weak doughs.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety.

ND 522 (2.4 - 44/18)

Kernel Characteristics - Satisfactory to Questionable. Occasional low test weight and low protein content.



ND 522 (Cont'd.)

Milling Performance - Questionable to Unsatisfactory. Shows erratic milling results with a strong tendency for low flour extraction and high mineral content at 65% extraction.

Baking Evaluation - Questionable to Satisfactory. Shows maximum mixing time and erratic dough-handling properties.

General Evaluation - This selection would show little promise as a new variety, based on this year's crop results, primarily due to erratic results.

ND 525 (2.7 - 33/8)

Kernel Characteristics - Satisfactory. Occasional low test weight.

Milling Performance - Satisfactory to Questionable. Occasional large protein drop from wheat to flour.

Baking Evaluation - Questionable to Satisfactory. Strong tendency for having weak doughs.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety.

Entry #24 (1.0 - 3/1) (Aberdeen, Idaho station only)

Kernel Characteristics - Questionable to Satisfactory. Low protein content.

Milling Performance - Satisfactory to Questionable. Large protein drop from wheat to flour.

Baking Evaluation - Questionable to Unsatisfactory. Low bake absorption.

General Evaluation - Based on one station only, this selection would show no promise as a new variety for this crop year.



SAWFLY YIELD NURSERY SAMPLES - 1973 CROP

One hundred samples were received from two stations in Montana and three stations in North Dakota. Twenty samples were received from each of the stations: Havre and Sidney, Montana; and Fargo, Minot, and Williston, North Dakota. Five of these samples were the named varieties: Chinook, Chris, Fortuna, Rescue, and Thatcher. Also grown was the named variety Tioga (ND 6662), which was released this year. Thirteen of the samples were the selections: CN 774315, CN 782846, MT 711, MT 722, MT 727, MT 7111, S 6912, S 6916, S 7003, S 7018, S 7064, S 7068, and 70110. In addition, the selection ND 6851 was grown at the Montana stations and at the Williston, North Dakota station. The selection S 6851 was grown at the Fargo and Minot, North Dakota stations only. The data for these samples from the individual stations are given in Tables 18 through 20. In Table 21 are the averages for these data. Again, averages and blends may not reflect the range of response of a selection or variety to environmental conditions; therefore, averages of the general evaluation, number of total deficiencies, and the number of major deficiencies are given as they were for the Field Plot series and the Uniform Regional Nursery series. The varieties of Chinook, Chris, Fortuna, Rescue, Thatcher, and Tioga (ND 6662) from each station were averaged for a standard of performance and results of the individual samples were compared to this average.

<u>Chinook</u>	(3.8 - 1/0)	- Good Promise
<u>Chris</u>	(3.4 - 7/1)	- Good Promise
<u>Fortuna</u>	(2.4 - 6/3)	- Some Promise
<u>Rescue</u>	(3.0 - 12/2)	- Some Promise
<u>Thatcher</u>	(2.4 - 21/2)	- Little Promise
<u>Tioga</u>	(3.6 - 4/0)	- Good Promise
<u>CN 774315</u>	(2.6 - 16/6)	

Kernel Characteristics - Questionable to Unsatisfactory. Poor kernel size distribution.

Milling Performance - Satisfactory.

Baking Evaluation - Questionable. Tendency for long mixing time.

General Evaluation - Based on this year's crop, this selection would show little promise as a new variety primarily due to long mixing time.



CN 782846 (3.0 - 7/4)

Kernel Characteristics - Satisfactory to Questionable. Tendency toward erratic kernel characteristics.

Milling Performance - Satisfactory to Questionable. Tendency toward high mineral content at 65% flour extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency toward erratic dough-handling properties.

General Evaluation - Based on this year's crop, this selection would show some promise as a new variety.

The Prospect - Based on two crop years' results, this selection shows some promise as a new variety.

MT 711 (2.4 - 10/3)

Kernel Characteristics - Satisfactory.

Milling Performance - Questionable to Unsatisfactory. High mineral content at 65% flour extraction.

Baking Evaluation - Questionable to Unsatisfactory. Shows long mixing time.

General Evaluation - This selection would show little promise as a new variety based on this year's crop, primarily because of high mineral content and too long mixing time.

The Prospect - Based on two crop years' results, this selection shows little promise as a new variety.

MT 722 (3.4 - 5/0)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Somewhat erratic dough-handling properties.

General Evaluation - Based on this year's crop, this selection would show some promise as a new variety.



MT 727 (2.4 - 10/3)

Kernel Characteristics - Questionable to Unsatisfactory. Minimum kernel size distribution.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency for long mixing time.

General Evaluation - Based on this year's crop, this selection would show little promise as a new variety.

MT 7111 (2.2 - 13/5)

Kernel Characteristics - Questionable to Satisfactory. Poor kernel size distribution and tendency for minimum test weight.

Milling Performance - Questionable to Unsatisfactory. Exhibits high mineral content at 65% flour extraction and shows a minimum flour extraction.

Baking Evaluation - Satisfactory.

General Evaluation - This selection would show little promise as a new variety based on this year's crop.

ND 6851 (3.7 - 2/0) (Williston, ND and Havre and Sidney, MT stations only)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

S 6851 (2.5 - 3/2) (Fargo and Minot, ND stations only)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency for minimum flour extraction.

Baking Evaluation - Questionable. Tendency for having weak dough and shows erratic mixing time.

General Evaluation - Based on this crop year's results, this selection would show little promise as a new variety.



S 6851 (Cont'd.)

The Prospect - Based on three crop years' results, this selection would show no promise as a new variety primarily because of erratic dough-handling properties and low flour extraction.

S 6912 (2.6 - 7/3)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory to Questionable. Tendency to have minimum flour extraction.

Baking Evaluation - Questionable. Tendency for minimum dough-handling properties and low loaf volume.

General Evaluation - This selection would show little promise as a new variety, based on this year's crop.

The Prospect - Based on two crop years' results, this selection would show little promise as a new variety because of minimum flour extraction and minimum dough-handling properties.

S 6916 (3.2 - 4/2)

Kernel Characteristics - Satisfactory to Questionable. Tendency for minimum wheat protein content.

Milling Performance - Satisfactory to Questionable. Tendency for minimum flour extraction.

Baking Evaluation - Questionable to Satisfactory. Shows weak doughs.

General Evaluation - This selection would show some promise as a new variety based on this year's crop results.

The Prospect - Based on two years' crop results, this selection would show little promise as a new variety primarily because of weak dough properties.

S 7003 (3.4 - 6/0)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency for minimum bake absorption.

General Evaluation - Based on this year's crop, this selection would show some promise as a new variety.



S 7018 (3.6 - 5/0)

Kernel Characteristics - Satisfactory.

Milling Performance - Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency for having weak doughs.

General Evaluation - Based on this year's crop results, this selection would show good promise as a new variety.

S 7064 (3.4 - 5/0)

Kernel Characteristics - Satisfactory to Questionable. Tendency for minimum wheat protein content.

Milling Performance - Satisfactory to Questionable. Tendency for minimum flour extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency for having weak doughs.

General Evaluation - This selection would show some promise as a new variety based on this year's crop results.

S 7068 (3.0 - 5/2)

Kernel Characteristics - Satisfactory.

Milling Performance - Questionable to Satisfactory. Tendency for high mineral content at 65% extraction.

Baking Evaluation - Satisfactory to Questionable. Tendency for long mixing time.

General Evaluation - Based on this year's crop results, this selection would show some promise as a new variety.

S 70110 (3.0 - 11/2)

Kernel Characteristics - Questionable. Tendency for low test weight, poor kernel size distribution, and low wheat protein.

Milling Performance - Very Satisfactory.

Baking Evaluation - Satisfactory to Questionable. Tendency for having weak doughs.

General Evaluation - Based on this year's crop results, this selection shows some promise as a new variety.



QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

1/ CLEAN DRY - SUBTRACT 1 LB./8U. FOR DOCKAGE-FREE T.W.

14% MOISTURE BASIS.  
2/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY-QUESTIONABLE, 3 = SATISFACTORY-SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE-UNSATISFACTORY, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.  
3/ 1 = NORMAL, 2 = NORMAL-SOFT, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.  
4/ 1 = REFERENCE MICROGRAPHS FOR IDENTIFICATION OF CURVE PATTERNS.  
5/ 1 = PLASTIC, 2 = ELASTIC, 3 = FLEXIBLE, 4 = PLIABLE, 5 = FLEXIBLE, 6 = PLIABLE, 7 = VERY STRONG.  
6/ 1 = 0.001, 2 = 0.002, 3 = 0.003, 4 = 0.004, 5 = 0.005, 6 = 0.006, 7 = 0.007, 8 = 0.008, 9 = 0.009, 10 = 0.010, 11 = 0.011, 12 = 0.012, 13 = 0.013, 14 = 0.014, 15 = 0.015, 16 = 0.016, 17 = 0.017, 18 = 0.018, 19 = 0.019, 20 = 0.020, 21 = 0.021, 22 = 0.022, 23 = 0.023, 24 = 0.024, 25 = 0.025, 26 = 0.026, 27 = 0.027, 28 = 0.028, 29 = 0.029, 30 = 0.030, 31 = 0.031, 32 = 0.032, 33 = 0.033, 34 = 0.034, 35 = 0.035, 36 = 0.036, 37 = 0.037, 38 = 0.038, 39 = 0.039, 40 = 0.040, 41 = 0.041, 42 = 0.042, 43 = 0.043, 44 = 0.044, 45 = 0.045, 46 = 0.046, 47 = 0.047, 48 = 0.048, 49 = 0.049, 50 = 0.050, 51 = 0.051, 52 = 0.052, 53 = 0.053, 54 = 0.054, 55 = 0.055, 56 = 0.056, 57 = 0.057, 58 = 0.058, 59 = 0.059, 60 = 0.060, 61 = 0.061, 62 = 0.062, 63 = 0.063, 64 = 0.064, 65 = 0.065, 66 = 0.066, 67 = 0.067, 68 = 0.068, 69 = 0.069, 70 = 0.070, 71 = 0.071, 72 = 0.072, 73 = 0.073, 74 = 0.074, 75 = 0.075, 76 = 0.076, 77 = 0.077, 78 = 0.078, 79 = 0.079, 80 = 0.080, 81 = 0.081, 82 = 0.082, 83 = 0.083, 84 = 0.084, 85 = 0.085, 86 = 0.086, 87 = 0.087, 88 = 0.088, 89 = 0.089, 90 = 0.090, 91 = 0.091, 92 = 0.092, 93 = 0.093, 94 = 0.094, 95 = 0.095, 96 = 0.096, 97 = 0.097, 98 = 0.098, 99 = 0.099, 100 = 0.100, 101 = 0.101, 102 = 0.102, 103 = 0.103, 104 = 0.104, 105 = 0.105, 106 = 0.106, 107 = 0.107, 108 = 0.108, 109 = 0.109, 110 = 0.110, 111 = 0.111, 112 = 0.112, 113 = 0.113, 114 = 0.114, 115 = 0.115, 116 = 0.116, 117 = 0.117, 118 = 0.118, 119 = 0.119, 120 = 0.120, 121 = 0.121, 122 = 0.122, 123 = 0.123, 124 = 0.124, 125 = 0.125, 126 = 0.126, 127 = 0.127, 128 = 0.128, 129 = 0.129, 130 = 0.130, 131 = 0.131, 132 = 0.132, 133 = 0.133, 134 = 0.134, 135 = 0.135, 136 = 0.136, 137 = 0.137, 138 = 0.138, 139 = 0.139, 140 = 0.140, 141 = 0.141, 142 = 0.142, 143 = 0.143, 144 = 0.144, 145 = 0.145, 146 = 0.146, 147 = 0.147, 148 = 0.148, 149 = 0.149, 150 = 0.150, 151 = 0.151, 152 = 0.152, 153 = 0.153, 154 = 0.154, 155 = 0.155, 156 = 0.156, 157 = 0.157, 158 = 0.158, 159 = 0.159, 160 = 0.160, 161 = 0.161, 162 = 0.162, 163 = 0.163, 164 = 0.164, 165 = 0.165, 166 = 0.166, 167 = 0.167, 168 = 0.168, 169 = 0.169, 170 = 0.170, 171 = 0.171, 172 = 0.172, 173 = 0.173, 174 = 0.174, 175 = 0.175, 176 = 0.176, 177 = 0.177, 178 = 0.178, 179 = 0.179, 180 = 0.180, 181 = 0.181, 182 = 0.182, 183 = 0.183, 184 = 0.184, 185 = 0.185, 186 = 0.186, 187 = 0.187, 188 = 0.188, 189 = 0.189, 190 = 0.190, 191 = 0.191, 192 = 0.192, 193 = 0.193, 194 = 0.194, 195 = 0.195, 196 = 0.196, 197 = 0.197, 198 = 0.198, 199 = 0.199, 200 = 0.200, 201 = 0.201, 202 = 0.202, 203 = 0.203, 204 = 0.204, 205 = 0.205, 206 = 0.206, 207 = 0.207, 208 = 0.208, 209 = 0.209, 210 = 0.210, 211 = 0.211, 212 = 0.212, 213 = 0.213, 214 = 0.214, 215 = 0.215, 216 = 0.216, 217 = 0.217, 218 = 0.218, 219 = 0.219, 220 = 0.220, 221 = 0.221, 222 = 0.222, 223 = 0.223, 224 = 0.224, 225 = 0.225, 226 = 0.226, 227 = 0.227, 228 = 0.228, 229 = 0.229, 230 = 0.230, 231 = 0.231, 232 = 0.232, 233 = 0.233, 234 = 0.234, 235 = 0.235, 236 = 0.236, 237 = 0.237, 238 = 0.238, 239 = 0.239, 240 = 0.240, 241 = 0.241, 242 = 0.242, 243 = 0.243, 244 = 0.244, 245 = 0.245, 246 = 0.246, 247 = 0.247, 248 = 0.248, 249 = 0.249, 250 = 0.250, 251 = 0.251, 252 = 0.252, 253 = 0.253, 254 = 0.254, 255 = 0.255, 256 = 0.256, 257 = 0.257, 258 = 0.258, 259 = 0.259, 260 = 0.260, 261 = 0.261, 262 = 0.262, 263 = 0.263, 264 = 0.264, 265 = 0.265, 266 = 0.266, 267 = 0.267, 268 = 0.268, 269 = 0.269, 270 = 0.270, 271 = 0.271, 272 = 0.272, 273 = 0.273, 274 = 0.274, 275 = 0.275, 276 = 0.276, 277 = 0.277, 278 = 0.278, 279 = 0.279, 280 = 0.280, 281 = 0.281, 282 = 0.282, 283 = 0.283, 284 = 0.284, 285 = 0.285, 286 = 0.286, 287 = 0.287, 288 = 0.288, 289 = 0.289, 290 = 0.290, 291 = 0.291, 292 = 0.292, 293 = 0.293, 294 = 0.294, 295 = 0.295, 296 = 0.296, 297 = 0.297, 298 = 0.298, 299 = 0.299, 300 = 0.300, 301 = 0.301, 302 = 0.302, 303 = 0.303, 304 = 0.304, 305 = 0.305, 306 = 0.306, 307 = 0.307, 308 = 0.308, 309 = 0.309, 310 = 0.310, 311 = 0.311, 312 = 0.312, 313 = 0.313, 314 = 0.314, 315 = 0.315, 316 = 0.316, 317 = 0.317, 318 = 0.318, 319 = 0.319, 320 = 0.320, 321 = 0.321, 322 = 0.322, 323 = 0.323, 324 = 0.324, 325 = 0.325, 326 = 0.326, 327 = 0.327, 328 = 0.328, 329 = 0.329, 330 = 0.330, 331 = 0.331, 332



## QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

1973 CROP

VARIETY OR SEL. NO.	T.M. #/BU.	1000 WT.	REBELLSIZE #/BU.	MT. MIN.	MT. MAX.	KERN. PRN.	KERN. PRN.	ELR. MIN.	ELR. MAX.	FLR. MIN.	FLR. MAX.	MLG. PRN.	MLG. MAX.	MIK. PRN.	MIK. MAX.	DOUGH GRUB.	DOUGH GRUB.	GRUB. GRUB.	LOAF JAKE CC.	GEN. EXL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
DICKINSON, NORTH DAKOTA																						
BONANZA	62.7	29.0	12	85	3	1.40	1.99	0	67.7	0.30	1.45	1	3	0.28	4	4	99.2	91.90	930	7	2	SM MP BA LV
BONANZA	63.7	30.1	21	78	1	1.29	1.54	0	67.7	0.33	1.40	1	2	0.19	4	4	99.2	91.90	930	7	2	SM MP BA LV
CHAS	59.1	28.5	13	85	2	1.53	1.62	3	67.3	0.36	1.56	1	3	0.25	3	3	100.0	91.99	1015	4	3	KA LG OU
CHAS	62.4	31.5	13	85	2	1.53	1.62	3	67.3	0.36	1.56	1	3	0.25	3	3	100.0	91.99	1015	4	3	KA LG OU
PORTUNA	61.0	26.0	26	72	2	1.26	1.50	5	65.8	0.34	1.24	1	2	0.19	3	3	100.0	88.09	975	7	2	MP OU
GLENLEA	59.0	32.2	26	72	2	1.26	1.50	5	65.8	0.34	1.24	1	2	0.19	3	3	100.0	88.09	975	7	2	MP OU
JUSTIN	59.1	31.2	50	49	1	1.41	1.63	2	66.4	0.34	1.36	1	2	0.44	4	4	99.2	86.10	1125	8	1	OU SM MP OU
LARKIN	61.8	29.3	3	95	2	1.55	1.76	2	68.2	0.31	1.46	1	2	0.67	6	6	101.0	90.99	960	8	1	KA SM MP OU
LARKIN	61.8	29.3	3	95	2	1.55	1.76	2	68.2	0.31	1.46	1	2	0.67	6	6	101.0	90.99	960	8	1	KA SM MP OU
NAPAJA	60.4	28.8	25	74	1	1.43	1.67	2	67.4	0.34	1.56	2	3	0.25	3	3	100.0	88.07	985	7	2	BA
NORANA	60.2	28.2	10	88	2	1.33	1.44	0	64.2	0.30	1.38	2	4	0.44	4	4	100.0	88.99	1025	5	2	EX LG MP OU
NORANA	61.2	21.3	22	87	1	1.33	1.44	0	64.2	0.30	1.38	2	4	0.44	4	4	100.0	88.99	1025	5	2	EX LG MP OU
NORANZA	60.1	28.8	17	82	1	1.39	1.57	2	65.0	0.32	1.42	2	3	0.82	6	6	101.0	85.07	1015	3	3	PO OU LV
PULK	62.1	31.6	17	82	1	1.43	1.64	2	66.5	0.36	1.57	1	2	0.82	6	6	101.0	85.07	1015	3	3	PO OU LV
WALORUN	60.1	29.1	26	73	1	1.50	1.71	2	68.2	0.36	1.62	1	3	0.79	5	5	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60	2	1.29	1.60	2	68.1	0.34	1.49	1	4	0.59	3	3	99.2	86.10	1025	3	3	OU
WALORUN	62.4	30.3	38	60</																		



### QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

[illegible]



### QUALITY DATA ON FIELD PLOT NURSERY SAMPLES

VARIETY OR SEL. NO.	T <sub>100</sub> 4700	1000 KMT.	SEEDLING LG MED SM	MMT. 4	PRO. 2	KERR. 3	FLR. 3	MIN-J 3	FLR. 3	MLG 3	PHU. 3	CHAM. 3	PER. 3	MIX. 3	MIX. 3	BAKE 3	MIX. 3	DOUGH 3	GRUMB 3	CRUMB 3	GRAIN 3	LOAF 3	BAKE 3	GEN. 3	MAJOR DEFICIENCY	
STATE AVERAGES FOR NORTH DAKOTA																										
CHRIS	58.0	23.1	7	62	11	1.57	17.3	7	65.8	0.37	16.9	1	3	64.1	4	63.7	3.37	3	100.3	89.00	97.8	2	2	2	2	LG
JUSTIN	58.3	21.9	29	67	4	1.53	17.3	2	66.3	0.34	16.7	1	2	65.6	5	65.7	4.37	2	99.9	82.25	100.8	4	3	DU	3	
CROP YEAR AVERAGE																										
1912 AVERAGE	61.8	21.2	41	57	2	1.50	14.1	4	66.4	0.32	16.9	1	2	63.3	3	61.7	2.79	3	101.5	87.00	89.4	4	3	4P BA	MUG	
1913 AVERAGE	58.9	26.9	17	75	8	1.51	16.5	3	65.1	0.37	15.9	1	4	63.6	6	64.3	4.13	3	100.0	85.05	99.4	2	3	4P LG	MUG	
CLEAN URY = SUGARACT 1 LB/100, FUR DUCKAGE=FREE 1**																										
1/ VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																										
1/ 1 = VERY SATISFACTORY, 2 = SATISFACTORY, 3 = SATISFACTORY-QUESTIONABLE, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																										
1/ REFER TO REFERENCE DIAGRAMS FOR NUMERICAL CURVE PATTERNS. 11 = VERY WEAK, 12 = WEAK, 13 = PLIABLE, 14 = ELASTIC, 15 = VERY STRONG																										
1/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK, 9 = WEAK, 10 = VERY WEAK, 20 = SLIGHTLY WEAK, 30 = DEAD.																										
1/ XXX-9 = BRIGHT WHITE, XXX-8 = WHITE, XXX-7 = SLIGHTLY GREY, XXX-6 = UNBRIGHT GREY, XXX-5 = GREY, XXX-4 = VERY GREY, XXX-3 = GRAY, XXX-2 = DULL GRAY, XXX-1 = VERY GRAY.																										
1/ XXX-0 = SLIGHTLY GREY, XXX-10 = SLIGHTLY GREY, XXX-11 = SLIGHTLY GREY, XXX-12 = SLIGHTLY GREY, XXX-13 = SLIGHTLY GREY, XXX-14 = SLIGHTLY GREY, XXX-15 = SLIGHTLY GREY, XXX-16 = SLIGHTLY GREY, XXX-17 = SLIGHTLY GREY, XXX-18 = SLIGHTLY GREY, XXX-19 = SLIGHTLY GREY, XXX-20 = SLIGHTLY GREY, XXX-21 = SLIGHTLY GREY, XXX-22 = SLIGHTLY GREY, XXX-23 = SLIGHTLY GREY, XXX-24 = SLIGHTLY GREY, XXX-25 = SLIGHTLY GREY, XXX-26 = SLIGHTLY GREY, XXX-27 = SLIGHTLY GREY, XXX-28 = SLIGHTLY GREY, XXX-29 = SLIGHTLY GREY, XXX-30 = SLIGHTLY GREY, XXX-31 = SLIGHTLY GREY, XXX-32 = SLIGHTLY GREY, XXX-33 = SLIGHTLY GREY, XXX-34 = SLIGHTLY GREY, XXX-35 = SLIGHTLY GREY, XXX-36 = SLIGHTLY GREY, XXX-37 = SLIGHTLY GREY, XXX-38 = SLIGHTLY GREY, XXX-39 = SLIGHTLY GREY, XXX-40 = SLIGHTLY GREY, XXX-41 = SLIGHTLY GREY, XXX-42 = SLIGHTLY GREY, XXX-43 = SLIGHTLY GREY, XXX-44 = SLIGHTLY GREY, XXX-45 = SLIGHTLY GREY, XXX-46 = SLIGHTLY GREY, XXX-47 = SLIGHTLY GREY, XXX-48 = SLIGHTLY GREY, XXX-49 = SLIGHTLY GREY, XXX-50 = SLIGHTLY GREY, XXX-51 = SLIGHTLY GREY, XXX-52 = SLIGHTLY GREY, XXX-53 = SLIGHTLY GREY, XXX-54 = SLIGHTLY GREY, XXX-55 = SLIGHTLY GREY, XXX-56 = SLIGHTLY GREY, XXX-57 = SLIGHTLY GREY, XXX-58 = SLIGHTLY GREY, XXX-59 = SLIGHTLY GREY, XXX-60 = SLIGHTLY GREY, XXX-61 = SLIGHTLY GREY, XXX-62 = SLIGHTLY GREY, XXX-63 = SLIGHTLY GREY, XXX-64 = SLIGHTLY GREY, XXX-65 = SLIGHTLY GREY, XXX-66 = SLIGHTLY GREY, XXX-67 = SLIGHTLY GREY, XXX-68 = SLIGHTLY GREY, XXX-69 = SLIGHTLY GREY, XXX-70 = SLIGHTLY GREY, XXX-71 = SLIGHTLY GREY, XXX-72 = SLIGHTLY GREY, XXX-73 = SLIGHTLY GREY, XXX-74 = SLIGHTLY GREY, XXX-75 = SLIGHTLY GREY, XXX-76 = SLIGHTLY GREY, XXX-77 = SLIGHTLY GREY, XXX-78 = SLIGHTLY GREY, XXX-79 = SLIGHTLY GREY, XXX-80 = SLIGHTLY GREY, XXX-81 = SLIGHTLY GREY, XXX-82 = SLIGHTLY GREY, XXX-83 = SLIGHTLY GREY, XXX-84 = SLIGHTLY GREY, XXX-85 = SLIGHTLY GREY, XXX-86 = SLIGHTLY GREY, XXX-87 = SLIGHTLY GREY, XXX-88 = SLIGHTLY GREY, XXX-89 = SLIGHTLY GREY, XXX-90 = SLIGHTLY GREY, XXX-91 = SLIGHTLY GREY, XXX-92 = SLIGHTLY GREY, XXX-93 = SLIGHTLY GREY, XXX-94 = SLIGHTLY GREY, XXX-95 = SLIGHTLY GREY, XXX-96 = SLIGHTLY GREY, XXX-97 = SLIGHTLY GREY, XXX-98 = SLIGHTLY GREY, XXX-99 = SLIGHTLY GREY, XXX-100 = SLIGHTLY GREY.																										
1/ 0 = NO PROMISE, 2 = LITTLE PROMISE, 3 = SOME PROMISE, 4 = GOOD PROMISE, 5 = VERY GOOD PROMISE, 6 = EXCELLENT PROMISE, 7 = SUPERB PROMISE, 8 = PERFECT PROMISE, 9 = IDEAL PROMISE, 10 = PERFECT PROMISE, 11 = PERFECT PROMISE, 12 = PERFECT PROMISE, 13 = PERFECT PROMISE, 14 = PERFECT PROMISE, 15 = PERFECT PROMISE, 16 = PERFECT PROMISE, 17 = PERFECT PROMISE, 18 = PERFECT PROMISE, 19 = PERFECT PROMISE, 20 = PERFECT PROMISE, 21 = PERFECT PROMISE, 22 = PERFECT PROMISE, 23 = PERFECT PROMISE, 24 = PERFECT PROMISE, 25 = PERFECT PROMISE, 26 = PERFECT PROMISE, 27 = PERFECT PROMISE, 28 = PERFECT PROMISE, 29 = PERFECT PROMISE, 30 = PERFECT PROMISE, 31 = PERFECT PROMISE, 32 = PERFECT PROMISE, 33 = PERFECT PROMISE, 34 = PERFECT PROMISE, 35 = PERFECT PROMISE, 36 = PERFECT PROMISE, 37 = PERFECT PROMISE, 38 = PERFECT PROMISE, 39 = PERFECT PROMISE, 40 = PERFECT PROMISE, 41 = PERFECT PROMISE, 42 = PERFECT PROMISE, 43 = PERFECT PROMISE, 44 = PERFECT PROMISE, 45 = PERFECT PROMISE, 46 = PERFECT PROMISE, 47 = PERFECT PROMISE, 48 = PERFECT PROMISE, 49 = PERFECT PROMISE, 50 = PERFECT PROMISE, 51 = PERFECT PROMISE, 52 = PERFECT PROMISE, 53 = PERFECT PROMISE, 54 = PERFECT PROMISE, 55 = PERFECT PROMISE, 56 = PERFECT PROMISE, 57 = PERFECT PROMISE, 58 = PERFECT PROMISE, 59 = PERFECT PROMISE, 60 = PERFECT PROMISE, 61 = PERFECT PROMISE, 62 = PERFECT PROMISE, 63 = PERFECT PROMISE, 64 = PERFECT PROMISE, 65 = PERFECT PROMISE, 66 = PERFECT PROMISE, 67 = PERFECT PROMISE, 68 = PERFECT PROMISE, 69 = PERFECT PROMISE, 70 = PERFECT PROMISE, 71 = PERFECT PROMISE, 72 = PERFECT PROMISE, 73 = PERFECT PROMISE, 74 = PERFECT PROMISE, 75 = PERFECT PROMISE, 76 = PERFECT PROMISE, 77 = PERFECT PROMISE, 78 = PERFECT PROMISE, 79 = PERFECT PROMISE, 80 = PERFECT PROMISE, 81 = PERFECT PROMISE, 82 = PERFECT PROMISE, 83 = PERFECT PROMISE, 84 = PERFECT PROMISE, 85 = PERFECT PROMISE, 86 = PERFECT PROMISE, 87 = PERFECT PROMISE, 88 = PERFECT PROMISE, 89 = PERFECT PROMISE, 90 = PERFECT PROMISE, 91 = PERFECT PROMISE, 92 = PERFECT PROMISE, 93 = PERFECT PROMISE, 94 = PERFECT PROMISE, 95 = PERFECT PROMISE, 96 = PERFECT PROMISE, 97 = PERFECT PROMISE, 98 = PERFECT PROMISE, 99 = PERFECT PROMISE, 100 = PERFECT PROMISE.																										



[illegible]







### QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

VARIETY OR BEL. N.		1000 KAT.			BREL. SIZE			WHT. MIN.		WHT. PRU.		KERN. CHAR.		FUR. EXT.		FUR. MIN.		FLR. CHAR.		MLG. PER.		MIX. PAT.		MIX. ABS.		BAKE ABS.		MIX. TIME		DOUGH CHAR.		CRUMBS GRAIN		LOAF WAKE		GEN. EVAL.		MINOR DEFICIENCY		MAJOR DEFICIENCY									
		G.			L			M			S			M			L			M			S			M			L			M			S			M			L			M					
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15			16		
		1			2			3			4			5			6			7			8			9			10			11			12			13			14			15					



[illegible]



### QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

[illegible][illegible]



### QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

[illegible]



### QUALITY DATA UN UNIFORM REGIONAL NUKSEKY SAMPLES

[illegible]



TABLE 12

[illegible]



# QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

```

198 101510906 04313.
199
200 1 = VERY SATISFACTORY, 2 = SATISFACTORY-QUESTIONABLE, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.

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REFER TO REFERENCE MIXOGRAMS FOR NOMINAL CURVE PATTERNS. (1 = VERY STRONG)  
 1/ 2/ 3/ 4/ 5/ 6/ 7/ 8/ 9/ 10/ 11/ 12/ 13/ 14/ 15/ 16/ 17/ 18/ 19/ 20/ 21/ 22/ 23/ 24/ 25/ 26/ 27/ 28/ 29/ 30/ 31/ 32/ 33/ 34/ 35/ 36/ 37/ 38/ 39/ 40/ 41/ 42/ 43/ 44/ 45/ 46/ 47/ 48/ 49/ 50/ 51/ 52/ 53/ 54/ 55/ 56/ 57/ 58/ 59/ 60/ 61/ 62/ 63/ 64/ 65/ 66/ 67/ 68/ 69/ 70/ 71/ 72/ 73/ 74/ 75/ 76/ 77/ 78/ 79/ 80/ 81/ 82/ 83/ 84/ 85/ 86/ 87/ 88/ 89/ 90/ 91/ 92/ 93/ 94/ 95/ 96/ 97/ 98/ 99/ 100/ 101/ 102/ 103/ 104/ 105/ 106/ 107/ 108/ 109/ 110/ 111/ 112/ 113/ 114/ 115/ 116/ 117/ 118/ 119/ 120/ 121/ 122/ 123/ 124/ 125/ 126/ 127/ 128/ 129/ 130/ 131/ 132/ 133/ 134/ 135/ 136/ 137/ 138/ 139/ 140/ 141/ 142/ 143/ 144/ 145/ 146/ 147/ 148/ 149/ 150/ 151/ 152/ 153/ 154/ 155/ 156/ 157/ 158/ 159/ 160/ 161/ 162/ 163/ 164/ 165/ 166/ 167/ 168/ 169/ 170/ 171/ 172/ 173/ 174/ 175/ 176/ 177/ 178/ 179/ 180/ 181/ 182/ 183/ 184/ 185/ 186/ 187/ 188/ 189/ 190/ 191/ 192/ 193/ 194/ 195/ 196/ 197/ 198/ 199/ 200/ 201/ 202/ 203/ 204/ 205/ 206/ 207/ 208/ 209/ 210/ 211/ 212/ 213/ 214/ 215/ 216/ 217/ 218/ 219/ 220/ 221/ 222/ 223/ 224/ 225/ 226/ 227/ 228/ 229/ 230/ 231/ 232/ 233/ 234/ 235/ 236/ 237/ 238/ 239/ 240/ 241/ 242/ 243/ 244/ 245/ 246/ 247/ 248/ 249/ 250/ 251/ 252/ 253/ 254/ 255/ 256/ 257/ 258/ 259/ 260/ 261/ 262/ 263/ 264/ 265/ 266/ 267/ 268/ 269/ 270/ 271/ 272/ 273/ 274/ 275/ 276/ 277/ 278/ 279/ 280/ 281/ 282/ 283/ 284/ 285/ 286/ 287/ 288/ 289/ 290/ 291/ 292/ 293/ 294/ 295/ 296/ 297/ 298/ 299/ 300/ 301/ 302/ 303/ 304/ 305/ 306/ 307/ 308/ 309/ 310/ 311/ 312/ 313/ 314/ 315/ 316/ 317/ 318/ 319/ 320/ 321/ 322/ 323/ 324/ 325/ 326/ 327/ 328/ 329/ 330/ 331/ 332/ 333/ 334/ 335/ 336/ 337/ 338/ 339/ 340/ 341/ 342/ 343/ 344/ 345/ 346/ 347/ 348/ 349/ 350/ 351/ 352/ 353/ 354/ 355/ 356/ 357/ 358/ 359/ 360/ 361/ 362/ 363/ 364/ 365/ 366/ 367/ 368/ 369/ 370/ 371/ 372/ 373/ 374/ 375/ 376/ 377/ 378/ 379/ 380/ 381/ 382/ 383/ 384/ 385/ 386/ 387/ 388/ 389/ 390/ 391/ 392/ 393/ 394/ 395/ 396/ 397/ 398/ 399/ 400/ 401/ 402/ 403/ 404/ 405/ 406/ 407/ 408/ 409/ 410/ 411/ 412/ 413/ 414/ 415/ 416/ 417/ 418/ 419/ 420/ 421/ 422/ 423/ 424/ 425/ 426/ 427/ 428/ 429/ 430/ 431/ 432/ 433/ 434/ 435/ 436/ 437/ 438/ 439/ 440/ 441/ 442/ 443/ 444/ 445/ 446/ 447/ 448/ 449/ 450/ 451/ 452/ 453/ 454/ 455/ 456/ 457/ 458/ 459/ 460/ 461/ 462/ 463/ 464/ 465/ 466/ 467/ 468/ 469/ 470/ 471/ 472/ 473/ 474/ 475/ 476/ 477/ 478/ 479/ 480/ 481/ 482/ 483/ 484/ 485/ 486/ 487/ 488/ 489/ 490/ 491/ 492/ 493/ 494/ 495/ 496/ 497/ 498/ 499/ 500/ 501/ 502/ 503/ 504/ 505/ 506/ 507/ 508/ 509/ 510/ 511/ 512/ 513/ 514/ 515/ 516/ 517/ 518/ 519/ 520/ 521/ 522/ 523/ 524/ 525/ 526/ 527/ 528/ 529/ 530/ 531/ 532/ 533/ 534/ 535/ 536/ 537/ 538/ 539/ 540/ 541/ 542/ 543/ 544/ 545/ 546/ 547/ 548/ 549/ 550/ 551/ 552/ 553/ 554/ 555/ 556/ 557/ 558/ 559/ 560/ 561/ 562/ 563/ 564/ 565/ 566/ 567/ 568/ 569/ 570/ 571/ 572/ 573/ 574/ 575/ 576/ 577/ 578/ 579/ 580/ 581/ 582/ 583/ 584/ 585/ 586/ 587/ 588/ 589/ 590/ 591/ 592/ 593/ 594/ 595/ 596/ 597/ 598/ 599/ 600/ 601/ 602/ 603/ 604/ 605/ 606/ 607/ 608/ 609/ 610/ 611/ 612/ 613/ 614/ 615/ 616/ 617/ 618/ 619/ 620/ 621/ 622/ 623/ 624/ 625/ 626/ 627/ 628/ 629/ 630/ 631/ 632/ 633/ 634/ 635/ 636/ 637/ 638/ 639/ 640/ 641/ 642/ 643/ 644/ 645/ 646/ 647/ 648/ 649/ 650/ 651/ 652/ 653/ 654/ 655/ 656/ 657/ 658/ 659/ 660/ 661/ 662/ 663/ 664/ 665/ 666/ 667/ 668/ 669/ 670/ 671/ 672/ 673/ 674/ 675/ 676/ 677/ 678/ 679/ 680/ 681/ 682/ 683/ 684/ 685/ 686/ 687/ 688/ 689/ 690/ 691/ 692/ 693/ 694/ 695/ 696/ 697/ 698/ 699/ 700/ 701/ 702/ 703/ 704/ 705/ 706/ 707/ 708/ 709/ 710/ 711/ 712/ 713/ 714/ 715/ 716/ 717/ 718/ 719/ 720/ 721/ 722/ 723/ 724/ 725/ 726/ 727/ 728/ 729/ 730/ 731/ 732/ 733/ 734/ 735/ 736/ 737/ 738/ 739/ 740/ 741/ 742/ 743/ 744/ 745/ 746/ 747/ 748/ 749/ 750/ 751/ 752/ 753/ 754/ 755/ 756/ 757/ 758/ 759/ 760/ 761/ 762/ 763/ 764/ 765/ 766/ 767/ 768/ 769/ 770/ 771/ 772/ 773/ 774/ 775/ 776/ 777/ 778/ 779/ 780/ 781/ 782/ 783/ 784/ 785/ 786/ 787/ 788/ 789/ 790/ 791/ 792/ 793/ 794/ 795/ 796/ 797/ 798/ 799/ 800/ 801/ 802/ 803/ 804/ 805/ 806/ 807/ 808/ 809/ 810/ 811/ 812/ 813/ 814/ 815/ 816/ 817/ 818/ 819/ 820/ 821/ 822/ 823/ 824/ 825/ 826/ 827/ 828/ 829/ 830/ 831/ 832/ 833/ 834/ 835



TABLE 14  
QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

[illegible][illegible]







TABLE 16

QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

1973 CRUP

VARIETY OR SEL. NO.	T.M. #/BU.	1000 K.M.	RESEED G/BU.	MIN. T.M.	MAX. T.M.	KERN. CHN.	ELR. CHN.	MIN. CHN.	MAX. CHN.	ELR. CHN.	MIN. CHN.	MAX. CHN.	MIN. CHN.	MAX. CHN.	CRUMB COLOR	CRUMB GRAIN	LOAF BAKE	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY						
QUALITY DATA FOR UNIFORM BLENDS - REGULAR MIX																										
CHRIS	60.1	28.1	19	77	4	1.61	15.9	3	62.0	0.44	13.2	1	2	02.3	4	05.1	3.23	2	100.5	90.70	1000	4	3	64	L5	00
ERA	60.2	28.4	20	73	7	1.53	13.7	8	64.8	0.47	12.9	1	3	04.5	5	02.4	4.20	3	100.0	91.99	1020	8	1	64	M5	00
JUSTIN	59.9	31.8	34	62	4	1.70	16.0	2	62.1	0.44	13.5	1	2	02.0	6	06.0	4.20	3	101.0	89.05	975	2	4			00
SELKIRK	59.9	31.8	34	62	4	1.70	16.0	2	62.1	0.44	13.5	1	2	02.0	6	06.0	4.20	3	100.0	92.05	1020	2	4	64		00
WALDRON	59.7	33.4	45	52	3	1.60	15.7	2	62.6	0.43	13.2	1	3	03.7	2	03.0	3.73	2	100.0	99.05	1040	3	3	64		00
WALDRON	58.9	32.4	48	68	4	1.60	16.8	4	61.7	0.42	14.3	1	2	04.4	7	04.9	4.00	2	102.0	85.05	1035	6	2	64	AT	00
WALDRON	60.2	33.0	45	51	3	1.55	14.9	3	63.3	0.43	14.0	1	2	03.5	6	03.4	3.50	3	100.0	85.07	1035	6	2	64	AT	00
WALDRON	60.2	33.0	45	51	3	1.55	14.9	3	63.3	0.43	14.0	1	2	03.5	6	03.4	3.50	3	100.0	91.10	1035	6	2	64	AT	00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3	62.4	0.47	14.9	1	3	07.0	5	03.0	4.23	2	100.5	91.99	1010	2	4	64		00
WALDRON	58.0	31.0	32	64	4	1.66	15.4	3																		



TABLE 17  
QUALITY DATA ON UNIFORM REGIONAL NURSERY SAMPLES

[illegible]



TABLE 18

QUALITY DATA ON SAMPLE YIELD NURSERY SAMPLES

1973 GROUP

VARIETY OR SEL. NO.	T.W. #/BU.	1000 SEEDS	KEWEL STAGE	MIN. MIN.	MT. MT.	CHL. CHL.	EXT. EXT.	FLA. FLA.	MIN. MIN.	ELK. ELK.	MLC. MLC.	ALG. ALG.	MAX. MAX.	PLA. PLA.	MAK. MAK.	MIN. MIN.	CRUM. CRUM.	CRUM. CRUM.	LOAF VOL.	GEN. GEN.	MINOR EFFICIENCY	MAJOR EFFICIENCY
HAYRE, MONTANA																						
CHINOOK	54.5	27.0	6	83	11	1.72	16.6	2	63.6	0.57	10.4	1	2	68.6	3	68.6	92.70	188	2	4	UD	
CHRIS	57.0	20.8	2	80	13	1.00	17.0	3	63.6	0.53	10.4	1	2	63.7	3	63.7	87.09	190	2	4	LM	LG
FORTUNA	57.5	29.6	5	87	8	1.73	15.0	4	66.6	0.57	10.7	1	2	63.2	3	63.2	89.90	202	6	2	MP	UD
RESOLVE	57.5	29.6	5	87	8	1.73	15.0	4	66.6	0.57	10.7	1	2	63.2	3	63.2	89.90	202	6	2	MP	UD
THATCHER	55.0	19.6	1	76	23	1.83	18.2	4	62.4	0.54	10.0	1	2	67.7	3	67.7	86.05	194	2	3	LM	MT
MT 774315	56.0	21.1	1	79	20	2.13	16.5	3	63.6	0.59	10.3	1	2	67.9	10	67.9	86.05	225	8	1	LM	MT
MT 782466	51.5	21.2	2	76	19	1.05	17.1	8	62.7	0.58	10.3	1	2	68.7	6	68.7	90.99	197	4	1	LM	MT
MT 782466	51.5	21.2	2	76	19	1.05	17.1	8	62.7	0.58	10.3	1	2	68.7	6	68.7	90.99	197	4	1	LM	MT
MT 722	56.5	26.0	2	86	12	1.76	16.2	3	62.4	0.54	10.3	1	2	68.0	9	68.0	84.05	211	3	1	LM	MT
MT 727	55.5	20.4	1	78	21	1.89	18.1	8	62.3	0.51	10.3	1	2	68.0	9	68.0	84.05	192	3	1	LM	MT
MT 7111 (TIGON)	55.0	24.0	1	78	21	1.66	17.4	8	62.8	0.52	10.3	1	2	68.5	9	68.5	90.70	203	1	1	LM	MT
NO 6921	57.5	26.2	10	91	9	1.83	17.5	2	63.6	0.57	10.3	1	2	68.5	9	68.5	91.99	192	4	3	UD	
NO 6921	57.5	26.2	10	91	9	1.83	17.5	2	63.6	0.57	10.3	1	2	68.5	9	68.5	91.99	192	4	3	UD	
S 6912	56.5	26.5	10	82	14	1.73	16.4	2	62.0	0.57	10.2	1	2	63.7	5	63.7	91.59	194	5	3	UD	
S 6916	58.5	30.0	10	84	7	1.67	16.0	2	62.0	0.55	10.3	1	2	63.7	5	63.7	90.70	193	5	3	UD	
S 7004	54.0	25.4	5	82	12	1.85	17.3	3	64.3	0.53	10.3	1	2	67.3	8	67.3	91.99	205	2	3	LM	MT
S 7018	54.5	24.2	5	84	12	1.85	17.3	3	64.3	0.53	10.3	1	2	67.3	8	67.3	91.99	205	2	3	LM	MT
S 7064	57.0	25.4	5	85	19	1.09	16.3	2	62.9	0.57	10.3	1	2	67.9	7	67.9	86.39	203	2	4	LM	MT
S 7068	55.5	24.1	5	85	10	1.76	17.1	2	63.3	0.56	10.7	1	2	67.9	7	67.9	86.39	203	2	4	LM	MT
S 70110	51.5	25.6	2	79	19	1.71	16.3	6	64.3	0.57	10.1	1	2	66.5	6	66.5	91.59	198	4	1	LM	UD
STONE, MONTANA																						
CHINOOK	61.5	30.2	13	84	3	1.65	16.2	2	63.4	0.59	13.6	1	2	61.3	3	61.3	92.99	192	2	4	LM	
CHINOOK	61.5	30.2	13	84	3	1.65	16.2	2	63.4	0.59	13.6	1	2	61.3	3	61.3	92.99	192	2	4	LM	
FORTUNA	60.0	24.9	32	97	2	1.52	15.1	9	62.3	0.53	14.2	1	2	60.0	3	60.0	92.99	190	2	1	LM	
RESOLVE	58.5	21.2	2	91	7	1.81	16.4	8	63.4	0.57	13.5	1	2	62.5	6	62.5	86.39	202	6	1	LM	
THATCHER	60.0	25.8	6	90	4	1.71	16.5	3	63.6	0.53	14.3	1	2	60.3	3	60.3	92.99	185	6	2	LM	MT
MT 774315	54.0	25.3	3	90	7	1.96	14.1	2	63.3	0.51	13.0	1	2	60.3	6	60.3	86.39	214	4	3	LM	MT
MT 782466	63.0	34.9	9	97	4	1.70	13.6	4	66.7	0.50	13.2	1	2	63.3	6	63.3	90.70	226	6	3	LM	MT
MT 722	62.0	33.7	19	79	2	1.67	13.6	4	63.7	0.51	13.3	1	2	60.7	3	60.7	87.10	186	6	2	LM	MT
MT 727	61.0	28.5	3	91	6	1.73	14.5	3	63.7	0.53	13.6	1	2	64.7	6	64.7	91.99	185	2	4	LM	MT
MT 7111	54.5	27.9	2	92	6	1.80	14.9	8	64.6	0.54	14.7	1	2	61.6	4	61.6	90.70	195	2	1	LM	MT
NO 6662 (TIGON)	61.5	34.4	25	73	2	1.78	16.2	2	63.7	0.54	13.7	1	2	60.7	3	60.7	90.70	190	2	1	LM	MT
NO 6651	62.0	34.7	42	56	2	1.62	13.9	2	66.0	0.54	13.4	1	2	61.9	3	61.9	90.70	212	2	4	LM	MT
S 6912	60.0	30.6	14	83	3	1.62	14.4	2	64.0	0.53	13.3	1	2	61.9	3	61.9	93.99	189	3	3	LM	MT
S 6916	62.0	34.5	50	68	2	1.54	14.0	2	64.5	0.53	13.6	1	2	61.9	3	61.9	90.70	192	2	4	LM	MT
S 7004	61.0	34.4	28	70	2	1.63	13.4	4	67.1	0.53	14.0	1	2	60.3	4	60.3	86.39	191	4	3	LM	MT
S 7018	61.0	37.6	48	50	2	1.73	13.6	4	64.6	0.50	13.3	1	2	60.4	4	60.4	89.70	202	2	4	LM	MT
S 7064	62.0	34.3	17	80	3	1.72	13.3	3	63.7	0.54	13.0	1	2	63.8	3	63.8	90.70	200	2	4	LM	MT
S 7068	61.0	34.7	17	81	2	1.65	13.4	4	66.8	0.51	12.7	1	2	61.9	3	61.9	92.99	195	2	4	LM	MT
S 70110	58.5	27.2	3	90	3	1.73	13.5	6	63.1	0.52	13.3	1	2	62.5	3	62.5	91.99	195	2	4	LM	MT

1/ CLEAN DRY - SUBTRACT 1 LB./BU. FOR DOKAGE-FREE T.W.

2/ 14% MOISTURE BASIS.

3/ 1 = NORMAL, 2 = SATISFACTORY, 3 = SOFT-NORMAL, 4 = SOFT, 5 = GRITTY, 6 = VERY SOFT.

4/ 1 = REFERENCE MID-GRANULARS FOR NUMERICAL CURVE PATTERNS. 11 = VERY WEAK, 12 = VERY STRONG.

5/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

6/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

7/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

8/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

9/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

10/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

11/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

12/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

13/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

14/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

15/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

16/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

17/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

18/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

19/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

20/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

21/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

22/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

23/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

24/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

25/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

26/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

27/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

28/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

29/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.

30/ 1 = BUCKY, 2 = VERY ELASTIC, 3 = ELASTIC, 4 = ELASTIC-PLIABLE, 5 = PLIABLE-ELASTIC, 6 = PLIABLE, 7 = PLIABLE-WEAK, 8 = WEAK-PLIABLE, 9 = WEAK, 10 = SLIGHTLY DEAD, 11 = DEAD.



TABLE 19

QUALITY DATA ON SAWFLY YIELD NURSERY SAMPLES

1973 CROP

VARIETY DR.	SEL. NO.	T. #	1000 AWT.	SEEDLING SIZE	WHT. MIN.	WHT. PRO.	KERN. CHAR.	EXT. CHAR.	FLR. MIN.	FLR. MAX.	MLG. CHAR.	PER. ABS.	MIX. PAT.	BAKE ABS.	MIX. MIN.	CHAR. MIN.	CRUMB W.	CRUMB W.	LOAF EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
FARGO, NORTH DAKOTA																						
CHINOOK	61-5	33-0	14	85	1-50	15-3	2	63-5	0-35	14-9	1	2	62-8	4	63-4	4-00	3	101-4	88-09	202	2	4
CHRIS	61-0	20-5	14	89	1-48	15-7	2	63-2	0-35	15-5	1	3	61-9	4	61-9	3-75	3	101-8	90-09	203	2	4
FORTUNA	61-0	25-1	24	74	1-43	15-3	2	63-2	0-36	14-9	1	3	61-9	4	61-9	3-50	3	100-0	91-99	207	2	4
RESCUE	61-0	31-7	7	51	1-47	14-7	5	62-1	0-36	14-4	2	3	61-6	6	60-3	6-00	3	101-8	85-05	223	2	4
THATCHER	60-5	21-0	7	92	1-48	15-2	3	63-1	0-35	14-7	1	3	60-3	4	60-3	3-25	4	100-0	91-99	204	6	2
TIOGA (ND 6662)																						
CHINOOK	60-0	33-3	19	80	1-58	15-7	3	63-5	0-36	15-4	1	3	63-5	4	63-5	4-25	3	101-8	91-99	207	2	4
CHRIS	60-0	29-1	3	94	1-50	15-4	8	63-4	0-36	15-1	1	2	63-2	6	63-2	5-75	3	102-8	75-05	226	3	1
RESCUE	60-5	34-2	11	87	1-43	15-3	2	63-2	0-38	14-7	1	3	61-9	4	61-9	3-75	3	100-0	91-99	199	5	2
THATCHER	60-0	31-6	9	88	1-48	14-9	3	63-9	0-40	14-7	1	8	63-2	7	63-2	7-00	3	101-8	83-05	212	4	1
MT 722	60-0	33-1	33	66	1-30	15-2	2	62-8	0-34	14-0	1	2	62-5	4	62-5	4-25	3	100-3	90-99	211	2	4
MT 727	62-0	32-5	9	89	1-34	14-8	3	64-9	0-36	14-6	1	2	63-2	6	63-2	5-50	3	100-8	83-05	201	3	4
MT 711	59-5	34-4	11	87	1-40	16-0	3	62-3	0-36	15-6	2	3	64-4	4	64-4	4-00	3	101-8	83-09	212	2	4
MT 703	60-0	35-3	31	68	1-47	15-3	2	62-3	0-38	14-6	2	4	61-6	5	61-6	4-75	5	100-0	90-99	212	5	2
MT 708	60-0	34-5	47	52	1-41	14-5	3	63-2	0-35	14-3	1	2	62-3	5	62-3	4-25	5	101-8	83-07	191	6	2
MT 710	60-0	34-5	47	52	1-41	14-5	3	63-2	0-35	14-3	1	2	62-3	5	62-3	4-25	5	101-8	83-07	191	6	2
MT 703	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
MT 710	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 710	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 710	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 710	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6	61-0	5-50	3	100-0	90-99	202	2	4
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MT 708	60-0	34-6	22	77	1-41	15-1	2	64-4	0-37	14-7	1	3	61-0	6								



1473 CRUP

[illegible][illegible]



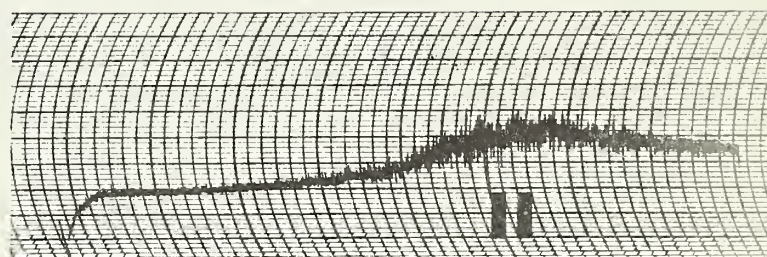
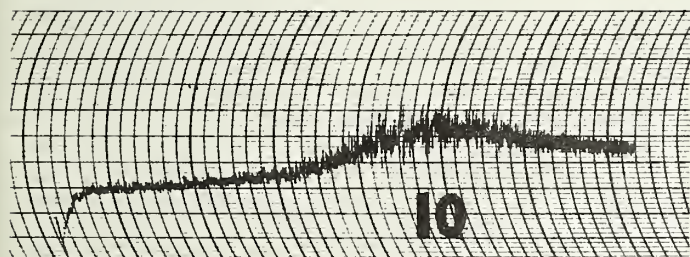
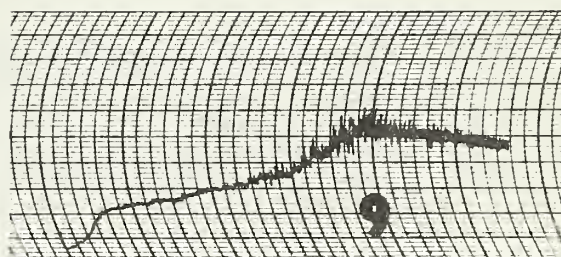
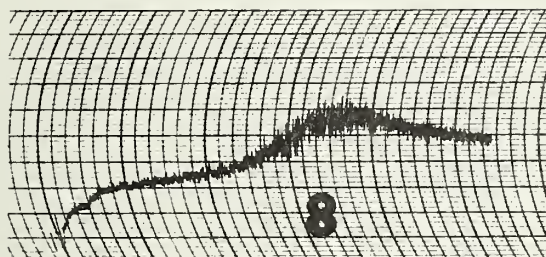
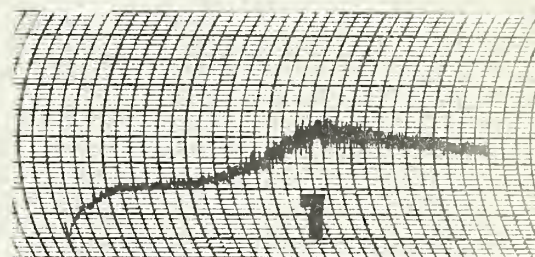
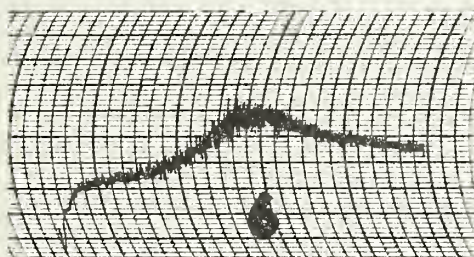
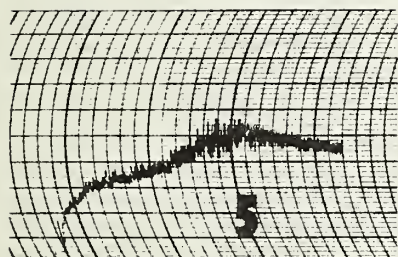
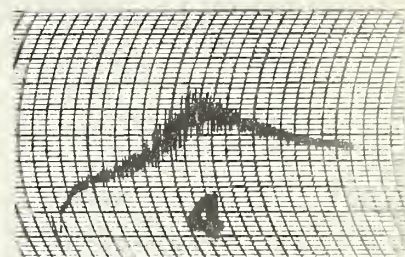
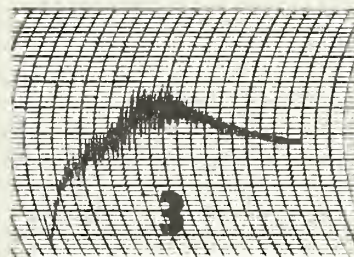
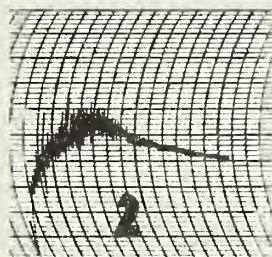
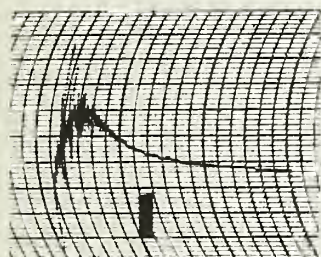
### QUALITY DATA ON SAWFLY YIELD NURSERY SAMPLES

VARIETY OR SEL. NO.	T.M. #/80.	1000 KMT.	KERNEL SIZE LO RD 3M	WMT. 27	WMT. 27	WMT. 27	KERN. CM.	FLR. EXT.	FLR. MIN.	ELR. PRO.	MLG. 3V	MIX. AD.	MIX. 5V	BAKE AL.	MIX. TIME	OUGH CRUMB 6V 7V	CRUMB 8V	LOAF BAKE EVAL.	GEN. EVAL.	MINOR DEFICIENCY	MAJOR DEFICIENCY
AVERAGE OF QUALITY DATA																					
CHINOOK	61-0	29-9	14	81	5	1-58	15-3	2	64-7	0-42	15-0	1	2	64-1	4	4	101-0	90-09	197	2	4
CHRIS	59-7	25-4	7	84	9	1-65	14-2	3	64-5	0-43	15-8	1	2	64-9	5	4	101-5	88-26	197	3	4
FORTUNA	60-6	33-7	23	73	4	1-56	16-8	3	65-6	0-42	14-4	1	2	62-2	2	3	101-8	91-31	207	3	4
RESCUE	59-2	25-2	6	83	11	1-68	15-1	4	63-4	0-43	14-8	1	3	63-9	6	3	102-7	85-26	209	3	4
THATCHER	59-0	23-9	6	84	10	1-66	15-3	4	64-6	0-46	15-0	1	3	62-5	3	4	100-9	90-22	196	4	3
TIOGA (ND 6662)	31-5	19	77	4	1-66	15-8	2	64-3	0-42	15-4	1	2	64-6	5	4	101-4	90-32	200	2	4	
CN 774-315	58-9	25-9	4	86	10	1-75	15-4	4	64-8	0-43	15-0	1	2	64-8	7	3	101-2	82-47	223	5	4
CN 782-846	58-2	27-9	12	80	8	1-61	15-2	3	63-6	0-46	14-8	1	4	65-1	4	4	101-1	88-76	201	2	3
CN 783-846	58-1	27-6	12	80	8	1-61	15-2	3	63-6	0-46	14-8	1	4	65-1	4	4	101-1	88-76	201	2	3
CN 7111	58-1	29-6	5	85	10	1-63	15-8	4	63-5	0-47	15-3	1	5	65-4	4	3	101-8	88-37	206	3	2
CN 722	59-9	31-9	21	74	5	1-55	15-3	2	63-4	0-42	15-0	1	3	64-4	5	4	101-6	88-44	202	2	4
CN 727	59-9	28-4	5	81	14	1-59	15-7	3	64-0	0-43	15-4	1	2	65-8	6	3	100-9	85-83	195	3	4
CN 728	59-8	28-4	5	81	14	1-59	15-7	3	64-0	0-43	15-4	1	2	65-8	6	3	100-9	85-83	195	3	4
CN 6951 11/	62-8	30-1	44	55	2	1-51	15-3	2	63-5	0-38	14-8	2	2	62-4	5	4	102-2	90-48	210	6	2
CN 6912	60-1	31-3	22	72	6	1-51	15-1	2	63-1	0-42	14-7	1	3	63-9	5	4	101-8	89-60	189	5	2
S 6916	60-7	34-5	28	68	4	1-49	15-0	2	63-3	0-40	14-8	1	2	64-4	5	4	101-8	88-39	200	2	4
S 6917	60-6	34-5	28	68	4	1-49	15-0	2	63-3	0-40	14-8	1	2	64-4	5	4	101-8	88-39	200	2	4
S 70110	59-6	30-7	11	78	7	1-50	14-7	2	62-9	0-35	14-3	1	2	63-2	5	3	100-9	89-62	197	2	4
S 70118	59-2	34-0	31	63	6	1-59	15-4	2	63-9	0-42	15-2	1	2	66-4	4	4	101-3	90-33	208	2	4
S 7064	60-4	33-6	23	71	6	1-50	14-9	2	63-4	0-40	14-7	1	2	65-8	6	4	101-5	89-22	208	2	4
S 7068	59-1	31-5	17	78	5	1-56	15-2	2	65-6	0-46	14-8	1	3	64-1	6	4	103-6	90-02	202	2	4
L/C CLEAN ORY - SUBTRACT 1 LB./80. FOR DOCKAGE-FREE T.M.																					
1/ 1 1/4 MOISTURE BASIS.																					
2/ 1 VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
3/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
4/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
5/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
6/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
7/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
8/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
9/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					
10/ 1 = VERY SATISFACTORY, 3 = SATISFACTORY, 4 = QUESTIONABLE-SATISFACTORY, 5 = QUESTIONABLE, 6 = QUESTIONABLE-UNSATISFACTORY, 7 = UNSATISFACTORY-QUESTIONABLE, 8 = UNSATISFACTORY.																					



# REFERENCE MIXOGRAMS

## HARD RED SPRING WHEAT



U.S.D.A. SPRING WHEAT QUALITY LABORATORY

FARGO, NORTH DAKOTA





